HITACHI

SERVICE MANUAL

TK **No. 2128E**

VT-88E,E(BS)

Technical Data

VT-88E

VT-88E (BS)

VHS

THIS VIDEO DECK IS A VHS TYPE VIDEO RECORDER.

FOR PROPER OPERATION, ONLY THE VHS TYPE CASSETTE MUST BE USED.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

June 1984 **TOKAI WORKS**

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SPECIFICATIONS

	VT-88E	VT-88E (BS)
Format:	VHS PAL Standard	← VHS PAL Standard
Recording:	Rotary Two-Head Helical Scan Azimuth Recording	← Rotary Two-Head Helical Scan Azimuth Recording
Tape Speed:	23.39 mm/sec. (VTR mode), 11.7 mm/sec. (ATR mode)	← 23.39 mm/sec. (VTR mode), 11.7 mm/sec. (ATR mode)
Tape Width:	12.7 mm	← 12.7 mm
Operation Temperature:	5°C to 40°C	← 5°C to 40°C
Video:	PAL colour (system B & G) & CCIR monochrome signals 625 lines	PAL colour (System I) & CCIR monochrome signals 625 lines
Recording Time:	240 min. (VTR mode)/480 min. (ATR mode) . . . . with Hitachi E-240 cassette	← 240 min. (VTR mode)/480 min. (ATR mode) . . . . with Hitachi E-240 cassette
Aerial Input:	VHF channels 2 – 12 UHF channels 21 – 69	UHF channels 21 – 69
RF Output:	UHF channels 37 (30 – 39 adjustable) (System G)	← UHF channels 37 (30 – 39 adjustable) (System G)
Video Input:	0.5 to 1.5V p-p 75 ohm Unbalanced	← 0.5 to 1.5V p-p 75 ohm Unbalanced
Video Output:	1V p-p 75 ohm Unbalanced	← 1V p-p 75 ohm Unbalanced
S/N Ratio (Video):	More than 43 dB	← More than 43 dB
Horizontal Resolution:	Colour 240 lines	← Colour 240 lines
Audio	–8 dBm 50 Kohm	← –8 dBm 50 Kohm
Input:	–8 dBm 1 Kohm	← –8 dBm 1 Kohm
Output:	50 dB (Dolby NR ON)	← 50 dB (Dolby NR ON)
S/N Ratio:	43 dB (Dolby NR OFF)	← 43 dB (Dolby NR OFF)
Frequency Range:	70 Hz to 12 kHz	← 70 Hz to 12 kHz
Hi-Fi Audio		
Frequency Range:	20 Hz to 20 kHz	← 20 Hz to 20 kHz
Dynamic Range:	More than 80 dB	← More than 80 dB
Wow and Flutter:	Less than 0.005% WRMS	← Less than 0.005% WRMS
Power:	AC 220V 50 Hz	AC 240V 50 Hz
Power Consumption:	45W (including timer)	← 45W (including timer)
Timer:	24 hour digital indication	12 hour digital indication
Cabinet Size:	435 mm(W) x 119 mm(H) x 370 mm(D)	← 435 mm(W) x 119 mm(H) x 370 mm(D)
Weight:	Approx. 12 kg	← Approx. 12 kg
Accessories Included:	1 – Aerial cable 1 – Infrared remote control unit 2 – Channel sheets 1 – Audio cable	← 1 – Aerial cable ← 1 – Infrared remote control unit ← 2 – Channel sheets ← 1 – Audio cable

* Design and specifications are subject to change without notice.

LIST OF DIFFERENCES

Model Different Section	VT-88E	VT-19E
REMOTE CONTROL SYSTEM AND MODES	WIRELESS: 13 MODES ● STOP/PLAY/RECORD/A.DUB/ F.FWD/REW/ REW SEARCH/REV SEARCH/ PAUSE/F.ADVANCE/OPERATE ON/OFF CHANNEL UP/ CHANNEL DOWN	WIRELESS: 13 MODES ● STOP/PLAY/RECORD/A.DUB/ F.FWD/REW/ REW SEARCH/REV SEARCH/ PAUSE/F.ADVANCE/SLOW/ CHANNEL UP/CHANNEL DOWN
TAPE SPEED	VTR: 23.3 mm/sec for AUDIO and VIDEO Recording/Playback ATR: 11.7 mm/sec for AUDIO Recroding/Playback	Both SP: 23.3 mm/sec LP: 11.7 mm/sec for Recording/Playback
OPERATION MODE		
PLAY	VTR/ATR modes	SP/LP
RECORD	VTR/ATR modes	SP/LP
A.DUB		SP/LP
VISUAL SEARCH	VTR mode: (x4) NOISE LOCK	SP: (x4) NOISE LOCK LP: (x7) NOISE LOCK
SLOW	NOT PROVIDED	SP: (1/4) SLOW LP: (1/2) SLOW
STILL	FRAME STILL (VTR MODE)	FIELD STILL (SP MODE) FRAME STILL (LP MODE)
FRAME ADVANCE	VTR mode	SP/LP
TAPE INDEX	PROVIDED	PROVIDED
DIMMER SWITCH	PROVIDED	PROVIDED
TIMER RECORDING	5 PROGRAMMES/2 WEEKS +1 WEEKLY	5 PROGRAMMES/2 WEEKS +1 WEEKLY
TUNING SYSTEM	VOLTAGE SYNTHESIZED TUNING SYSTEM	● MANUAL PRESET TUNING SYSTEM (for BS) ● VOLTAGE SYNTHESIZED TUNING SYSTEM (for SEV)
IRT (INSTANT RECORDING TIMER)	PROVIDED	PROVIDED

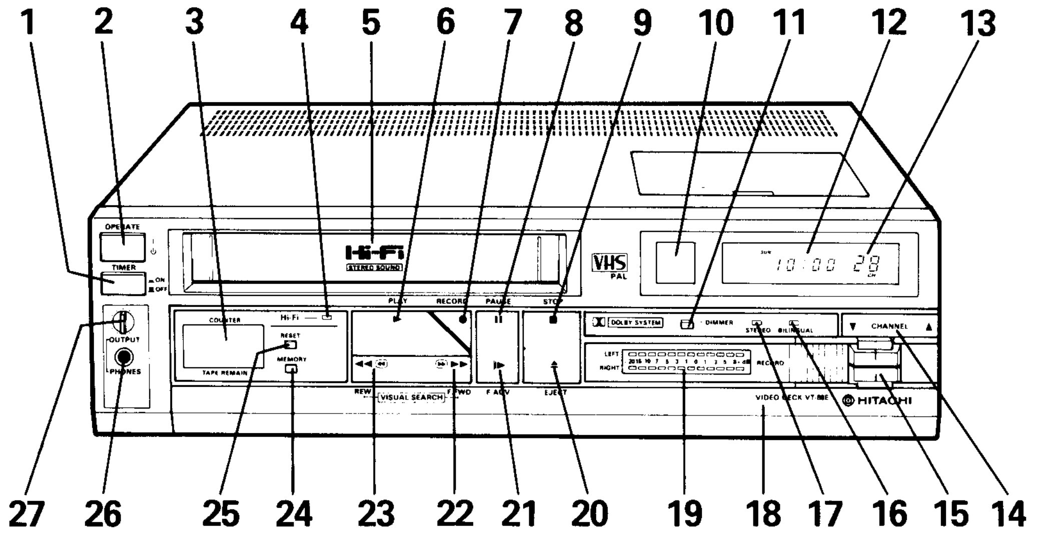
Model Different Section	VT-88E	VT-19E
TAPE REMAINING DISPLAY	HOUR/MINUTE DISPLAY	HOUR/MINUTE DISPLAY
SOUND MULTIPLEX/STEREO CIRCUIT	PROVIDED (for E, SEV)	PROVIDED (for SEV)
NOISE REDUCTION	B-TYPE DOLBY NR for LINEAR STEREO SOUND PEAK NOISE REDUCTION for Hi-Fi STEREO SOUND (COMPANDER SYSTEM)	B-TYPE DOLBY-NR STEREO SOUND
CAMERA/VIDEO/AUX SELECTOR (RECORDING SOURCE)	PROVIDED	PROVIDED
AUDIO CHANNEL SELECTOR (PLAYBACK OUTPUT)	CH-1 (L-CH)/CH-2 (R-CH)/ CH-1 + CH-2 (L-CH/R-CH)	CH-1 (L-CH)/CH-2 (R-CH)/ CH-1 + CH-2 (L-CH/R-CH)
PERI JACK	PROVIDED (for E, SEV)	PROVIDED (for SEV)
CASSETTE LOADING	AUTO FRONT LOADING	AUTO FRONT LOADING
VIDEO HEAD	4 HEADS ● +31 μm/–31 μm (AZIMUTH 80°) For VIDEO REC/PB ● +65 μm/65 μm (AZIMUTH 6°) For Hi-Fi AUDIO PB/REC	4 HEADS ● +36 μm/–36 μm For SP REC/PLAY, LP REC/PLAY, LP TRICK PLAY ● +75 μm/+75 μm For SP TRICK PLAY

SAFETY PRECAUTION

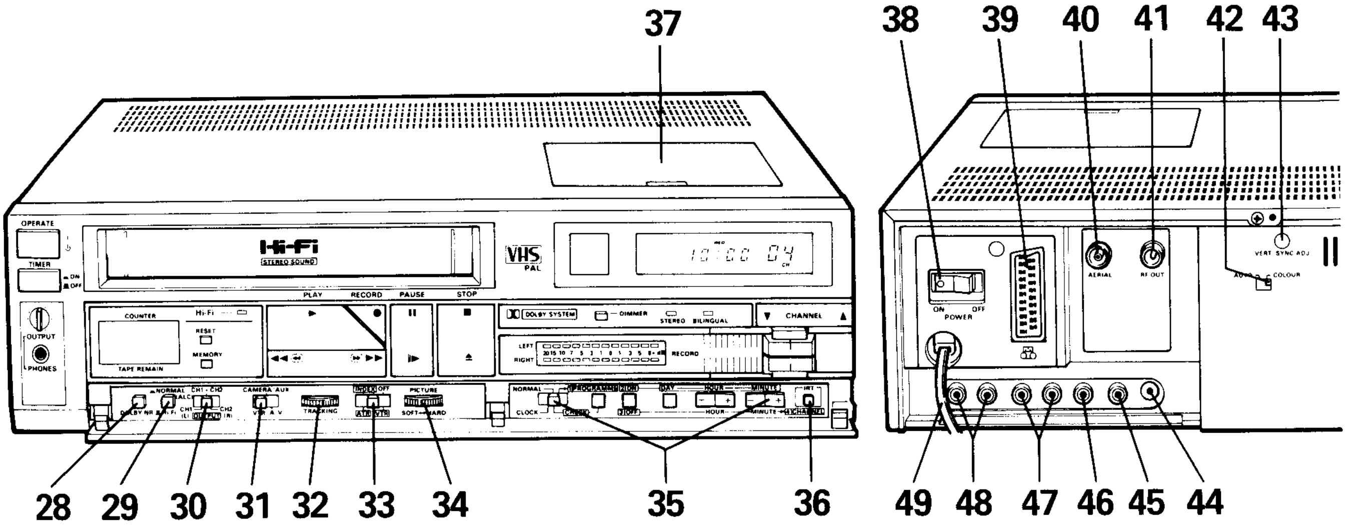
The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine Hitachi replacement parts. Especially critical parts in the power circuit block should not be replaced with other makes. Critical parts are marked with ⚠ in the schematic diagram and circuit board diagram.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to a scertain that it is completely safe to operate without danger of electrical shock.

KEY TO ILLUSTRATIONS


1
2
3
4
5
6
7
8
9
10
11
12
13
OPERATE
TIMER
ON
OFF
Hi-Fi
STEREO SOUND
VHS
PAL
10:00 28
COUNTER
Hi-Fi
RESET
MEMORY
TAPE REMAIN
PLAY
RECORD
PAUSE
STOP
DOLBY SYSTEM
DIMMER
STEREO
BILINGUAL
CHANNEL
OUTPUT
PHONES
LEFT
RIGHT
RECORD
REW
VISUAL SEARCH
F.FWD
F.ADV
EJECT
VIDEO DECK VT-88E
HITACHI
27
26
25
24
23
22
21
20
19
18
17
16
15
14

1. **TIMER SWITCH**
   Press after programming Digital Clock.
2. **OPERATE SWITCH**
   Turn system power on and off.
3. **COUNTER/TAPE REMAIN DISPLAY**
   Shows tape counter and remaining recording and playback time indications. And also shows the indicators of VTR, ATR cassette insertion, camera, counter memory and Dolby NR.
4. **Hi-Fi INDICATOR**
   Lights when the Hi-Fi/NORMAL/ALC select switch is in the released position.
5. **CASSETTE COMPARTMENT**
6. **PLAY BUTTON**
7. **RECORD BUTTON**
   Press RECORD button and while holding RECORD, press PLAY button to record.
8. **PAUSE BUTTON**
   Press to pause during recording.
   Press to view a still picture during playback.
   Press again to release.
9. **STOP BUTTON**
   The STOP button must be pressed between "RECORD" and any other operation.
10. **INFRARED RAY RECEIVING SECTION**
    Receives the infrared ray from remote control unit.
11. **DIMMER BUTTON**
    Press this button to select the brightness of clock display or to turn on/off the peak level indicator.
12. **CLOCK DISPLAY**
    This display is used as an indicator for the present time, the timer programming, the IRT time and the channel programming.
13. **CHANNEL INDICATOR DISPLAY**
    This shows the channel number corresponding to the channel selected.
14. **CHANNEL SELECT BUTTON**
    Select the channels you wish to view or record by pressing this button.
15. **RECORDING LEVEL CONTROLS**
    When recording with the ALC off, adjust these controls so that 3 red segments light occasionally (during especially loud portions).
16. **BILINGUAL INDICATOR**
17. **STEREO INDICATOR**
18. **SECONDARY CONTROL DOOR**
19. **PEAK LEVEL INDICATOR**
    Shows the peak input levels of each audio channel during recording and the recorded levels during playback.
20. **EJECT BUTTON**
    Press to remove cassette. The STOP button must be pressed before "EJECT".
21. **FRAME ADVANCE BUTTON**
    Press to view tape one frame at a time. Hold down button to advance frames continuously.
    Operates only after PAUSE button has been pressed.
22. **FAST FORWARD/VISUAL SEARCH BUTTON**
    Press to activate fast forward.
    Press this button during playback.
    Forward playback picture at high speed can be seen.
23. **REWIND/VISUAL SEARCH BUTTON**
    Press to start rewind.
    Press this button during playback.
    Reverse playback picture at high speed can be seen.
24. **COUNTER MEMORY BUTTON**
    When this button is ON, tape will stop at approximately "0000" reading during rewinding.
25. **COUNTER RESET BUTTON**
    To reset counter to "0000".
26. **HEADPHONE SOCKET**
27. **OUTPUT CONTROL**
    Adjusts the output level for headphone.



28. DOLBY NR SWITCH

If you want to reduce high frequency hiss, press this switch to in before recording, then begin recording and playback.

29. Hi-Fi/NORMAL/ALC SELECT SWITCH

This switch has two functions.

During playback release this switch (out and Hi-Fi position) for playback Hi-Fi sound on tape. Press in (NORMAL position) for playback of only the linear audio track. During recording press in to control the recording levels automatically. The recording levels are manually controlled with the Recording level controls when this switch is in the released position.

30. AUDIO CHANNEL SELECT SWITCH

Select the audio channel to be output.

CH1 + CH2: Left and right channels are output.

CH1: Only left channel is output.

CH2: Only right channel is output.

31. INPUT SELECT SWITCH

Select the recording signal from built-in tuner, a source connected AUDIO IN/VIDEO IN or PERI jack.

32. TRACKING CONTROL KNOB

To minimize noise in playback.

33. ATR/VTR/INDEX SELECT SWITCH

To use video deck as an audio deck set this switch to the ATR position. In the ATR position only audio signal is recorded. To use video deck normally, set to the VTR (center or right) position. Both audio and video signals are recorded.

The index function operates in the ATR and center of VTR positions. See page 18 for the index function.

34. PICTURE CONTROL

Adjust the picture so it is easy to see.

35. TIME SET BUTTONS

36. INSTANT RECORDING TIMER BUTTON (IRT)

This allows unattended recording.

Timer will switch the VTR off automatically at a preselected time. This is convenient when you go out during recording.

37. PRE-TUNING ACCESS DOOR

Open this door and set the channel.

38. MAINS POWER SWITCH

Mains Power switch ON-OFF.

39. PERI JACK

Connect this jack to the PERI jack on TV with PERI Cable. Refer to page 5.

40. AERIAL INPUT SOCKET

Connect external aerial.

41. RF OUTPUT

Connect to TV aerial input.

42. VIDEO MODE SWITCH

AUTO: Circuits are automatically switched to colour or black/white mode. This position is sufficient for most purposes.

COLOUR: When recording PAL signals in an area very far from the broadcasting station, the recorded picture may lose colour. In this case set to this position.

43. VERTICAL JITTER CONTROL (VERT. SYNC. ADJ.)

Correct vertical "jitter" if it occurs during still picture playback.

44. CAMERA PAUSE JACK

Connect Camera pause cable.

45. VIDEO IN

Receive video signal from a video camera or another VTR.

46. VIDEO OUT

Permit video connection of your unit to a monitor or another VTR.

47. AUDIO IN

Receive audio signals from a camera, external sound equipment or from another VTR.

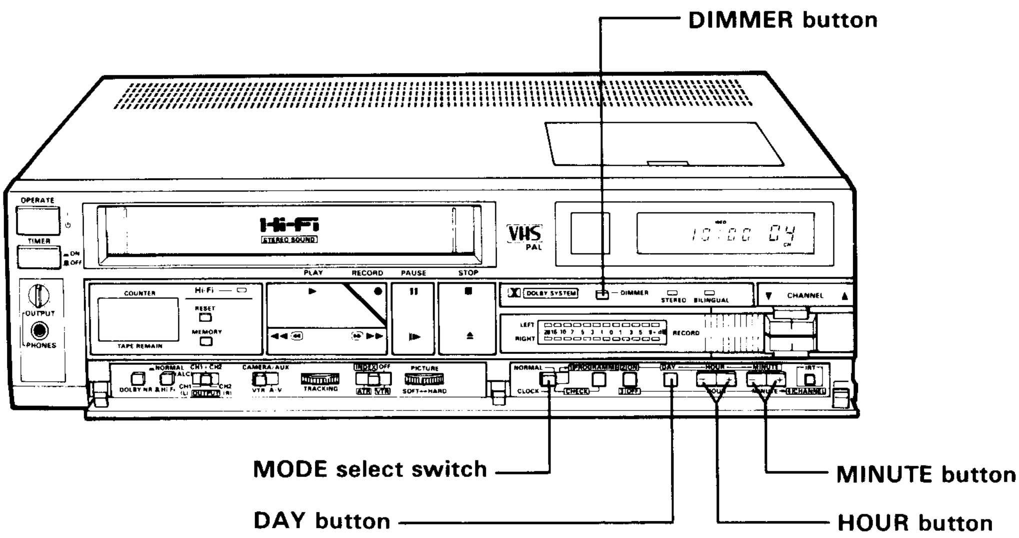
48. AUDIO OUT

Permit audio connection of your unit to a monitor, external sound equipment or another VTR.

49. MAINS LEAD

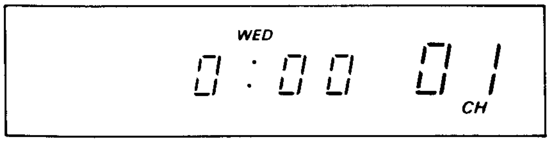
CLOCK TIME SETTING

The built-in digital clock is based on a 24 hour cycle and gives you a constant readout of the time and day.


DIMMER button
OPERATE
TIMER
Hi-Fi
VHS
PAL
PLAY
RECORD
PAUSE
STOP
COUNTER
MEMORY
OUTPUT
PHONES
CHANNEL
MODE select switch
DAY button
MINUTE button
HOUR button

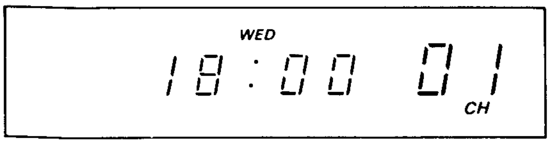
- When the MAINS POWER switch is ON for the first time, the digital clock display flashes "SUN 0:00".
- OPERATE switch may be ON or OFF for setting the clock.

1. Set the MODE select switch to "CLOCK".
2. Press the DAY button to select the present day of the week.
   The display stops flashing.
   Hold the button down to advance rapidly.


WED
0:00 01
CH

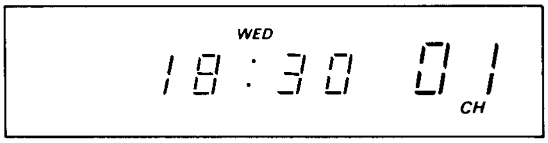
   For example, the above diagram shows that Wednesday (WED) has been set.

3. Press the HOUR button (forward or reverse) to set the present hour of day.
   Hold the button down to advance rapidly.


WED
18:00 01
CH

   For example, the above diagram shows that "18" hours have been set.

4. Press the MINUTE button (forward or reverse) to set the minute of day.
   Hold the button down to advance rapidly.


WED
18:30 01
CH

   For example, the diagram shows that "30" minutes have been set. Now the clock has been set to the correct time of day.

5. Return the MODE select switch to "NORMAL".
   If the switch is left at "CLOCK", the clock will not advance.

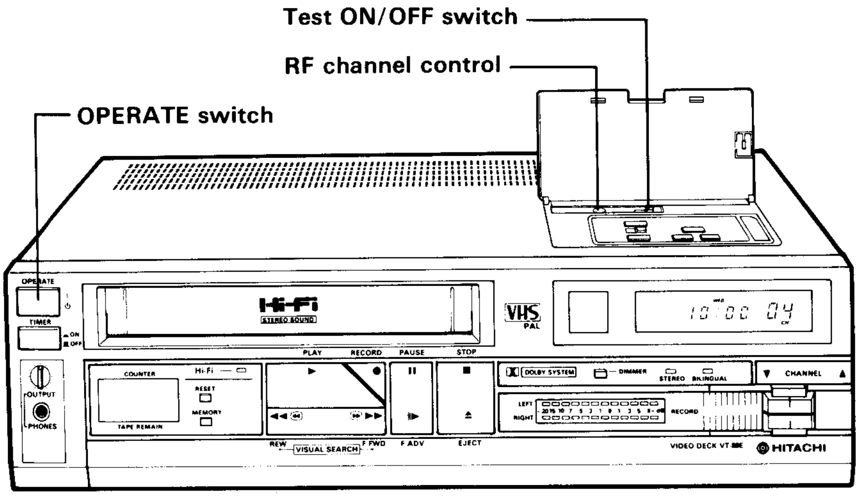
   For zero second setting, set minutes to one minute ahead of present time and move the MODE select switch to "NORMAL" when the exact start of the next minute is reached.

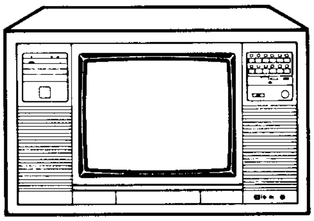
Notes:

- When a power failure occurs or the mains lead is disconnected from the AC outlet for less than approximately 15 minutes, the "PF" indicator lights to warn you. Or, if your clock display flashes "SUN 0:00", your home had a power failure for more than 15 minutes. The time should be reset.
  The "PF" indicator goes off when the MODE select switch is set to "CLOCK" and the clock is set. Then, set the MODE select switch to "NORMAL".
- Select the desired intensity level of display by pushing the DIMMER button.

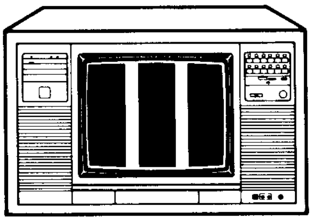
VIDEO CHANNEL SETTING

The RF converter changes the video and audio signals from a previously recorded video tape during playback to the same type of signal used for TV broadcasts. The RF converter output in this unit is pre-set prior to shipment to UHF channel 37.


Test ON/OFF switch
RF channel control
OPERATE switch
OPERATE
TIMER
ON
OFF
Hi-Fi
STEREO SOUND
VHS
PAL
PLAY
RECORD
PAUSE
STOP
COUNTER
RESET
MEMORY
TAPE REMAIN
OUTPUT
PHONES
REW
VISUAL SEARCH
F FWD
F ADV
EJECT
DOLBY SYSTEM
DIMMER
STEREO
BILINGUAL
CHANNEL
LEFT
RIGHT
RECORD
VIDEO DECK VT
HITACHI



1. Turn the TV on and select an unused channel (CH37) (in some cases this may be marked A/V).
2. Turn the OPERATE switch on.
3. Set the test ON/OFF switch to "ON". Then tune the TV until the test pattern shown below is received.



4. Having completed the adjustment, set the test ON/OFF switch to "OFF".

   NOTE:

   If it is not possible to correctly tune to the test pattern or channel 37 is used for broadcasting in your area, adjust the RF converter output with the RF channel control using a small screwdriver and re-adjust your TV until the test pattern is observed.

   For higher channel numbers, turn counterclockwise.

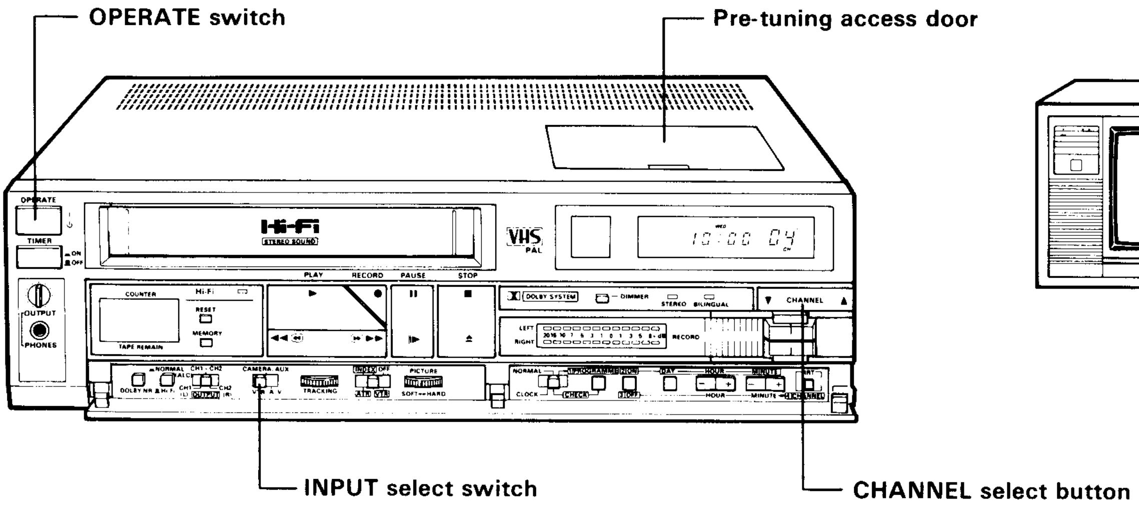
   For a lower channel, turn clockwise.

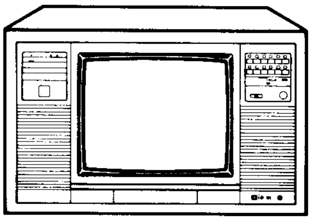
When connecting the VTR to a TV set provided with auto-tuning and the video channel cannot be set, operate as follows:

1. Remove the aerial cable from the AERIAL terminal of the VTR.
2. Leave the test ON/OFF switch "OFF".
3. Playback a blank tape.
4. Press the PAUSE button to obtain the pause mode.
5. Press the Auto-tuning button.
6. Auto-tuning starts and it stops at video channel 37.
   Note: The auto-tuning indicator of the TV set changes to an exact tuning indicator.
7. Set the channel memory of the TV to ON and store the channel which was set in item 6.
8. Set the test ON/OFF switch to ON and check that the picture appears on the TV screen.
   Now, the video channel of TV has been set properly.
9. Return the test ON/OFF switch to "OFF".
10. Reconnect the aerial cable to the VTR.

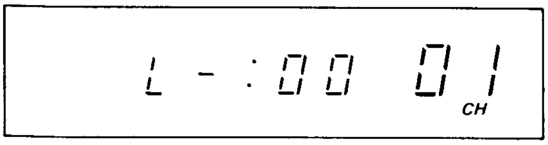
PRE-TUNING OF BUILT-IN TV TUNER

This deck incorporates a complete television tuner with the required tuning controls. Once you have pre-tuned to preferred stations, you can select any of them by merely pressing the CHANNEL select button.



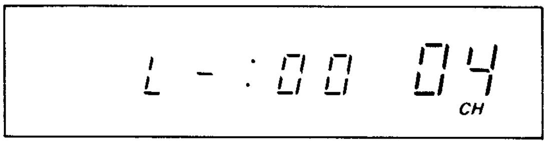


1. Turn the TV on and select the pre-tuned video channel.
2. Turn the OPERATE switch of the VTR on.
3. Set the INPUT select switch to "VTR".
4. Open the Pre-tuning access door to access the Pre-tuning controls.
5. Set the NORMAL/SELECT switch to "SELECT". The display indication changes from the clock time display to the band indicator display.



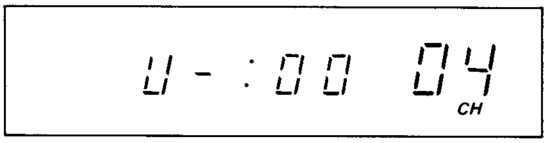
6. Press the CHANNEL select button on VTR to select the channel to be memorized.
   Note: The MEMORY indicator goes off to indicate which channel numbers have not been preset. If a channel number has been preset, its indicator will light. Some channel numbers have been preset at random.

   You should determine which channel memory positions have not been preset before entering programming information. New information automatically erases previously programmed data.



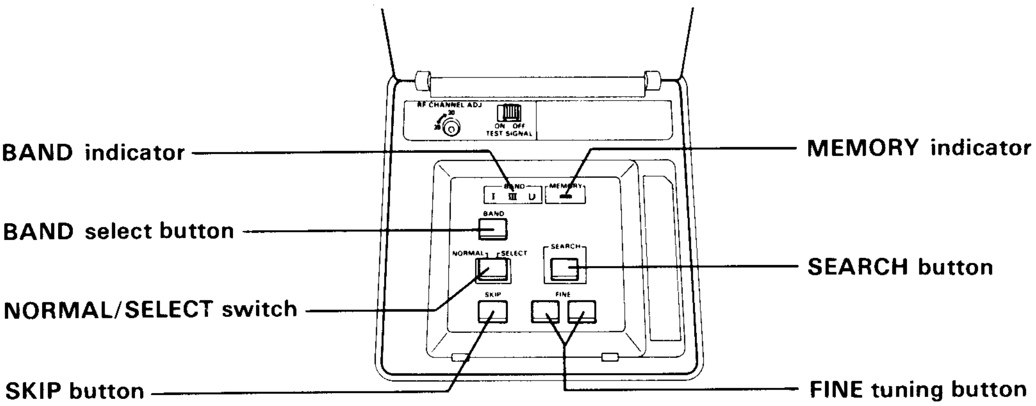
For example, the above diagram shows that channel 4 has been selected.

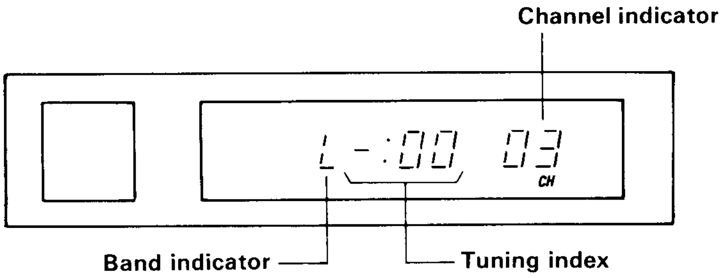
7. Press the BAND select button to select the desired band to be pre-tuned.
   To pre-tune to VHF low channels, select indication "L". Select "H" for VHF high channels and "U" for UHF channels. Refer to the table on page 12 for details.
   Indication on the display will change in sequence L, H, U, L .... continuously when this button is pressed.



For example, above diagram shows that the UHF band has been selected.

8. Press the SEARCH button to start tuning.
   The MEMORY indicator flashes on and off and the tuning index advances continuously.
   At a station that is broadcasting, the tuning index stops advancing and the MEMORY indicator lights to show the station has been preset in memory.
   The programmed picture appears on the TV screen.


BAND indicator
BAND select button
NORMAL/SELECT switch
SKIP button
MEMORY indicator
SEARCH button
FINE tuning button
RF CHANNEL ADJ
ON OFF
TEST SIGNAL
BAND
NORMAL SELECT
SEARCH
SKIP
FINE


Channel indicator
L -:00 03
CH
Band indicator
Tuning index

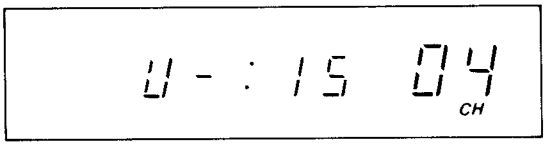
If the station received is not required to be preset, press the SEARCH button again. At the next station, the Tuning index will stop advancing and the MEMORY indicator will light, and the new station can be preset. Repeat this until the desired station is reached. By repeating this, the Band indicator on the display will change in sequence L, H, U, L....

If your TV picture is not clear, you must perform fine tuning.

Press and hold the FINE tuning button (forward or reverse) until a clear picture is obtained. In this case the AFS* facility is automatically cancelled only for the channel being fine tuned.

***AFS (Automatic Frequency Setting)**

An AFS circuit is employed in this video tuner. This AFS circuit automatically maintains best obtainable channel reception for optimum recording quality. However, the AFS facility is automatically cancelled and best picture is obtained when you fine tune the channel by pressing the FINE tuning button.



For example, the above diagram shows that an UHF station has been set in memory channel 4.

9. Follow the same steps as explained in steps 6 through 8 above for other channels.
   You can preset up to 39 channels in memory.
10. After having completed tuning all channel memories you want, return the NORMAL/SELECT switch to "NORMAL".

These channels preset in memory as shown in the above can be selected by the CHANNEL up/down select button on the VTR or infrared remote control unit.

The provided sheet is used to list the programmes to which you pre-tune your video deck. List the programmes and paste the sheet on the side panel, etc. so as not to hinder you when you operate the video deck.

Channel selection

The channel up and down controls on the VTR and the infrared remote control unit permits advancing the tuner directly to the next higher or lower programmed channel.

Eliminating unwanted preset channels

You can rearrange the desired channels by eliminating unwanted preset channels for channel up/down tuning.

1. Press the CHANNEL up/down select button until an unwanted channel is found.
2. Set the NORMAL/SELECT switch to "SELECT".
   The MEMORY indicator will come on.
3. Press the SKIP button
   The MEMORY indicator will go off indicating the channel has been erased from memory.
4. Repeat steps 1 and 3 until all unwanted channels have been erased.

5. After eliminating them, return the NORMAL/SELECT switch to "NORMAL".

The channels which have been erased cannot be selected by the CHANNEL up/down select button.

Adding channels

The channels can be newly added as described in "PRE-TUNING OF BUILT-IN TV TUNER", and you can also preset channels again which have previously been eliminated because they were unwanted.

Proceed as follows:

1. Set the NORMAL/SELECT switch to "SELECT". (The MEMORY indicator should be on.)
2. Press the CHANNEL select button on VTR to select the channel which had been prviously eliminated and you desire to preset again into the memory. The picture can be viewed on the TV screen. (The MEMORY indicator should go off.)
3. Press the SKIP button.
   The MEMORY indicator will come on.
   The channel has been programmed in memory again.
4. Repeat steps 2 and 3 for other channels if desired.
5. After adding channels, return the NORMAL/SELECT switch to "NORMAL".

These programmed channels can be selected by the CHANNEL up/down button.

CHANNEL-TUNING INDICATION TABLE

The following table shows the tuning indication of the corresponding channel numbers. Refer to it during pre-tuning. The table is for reference and it may slightly differ from the actual tuning index.

CH No. CCIR		Indication		CH No. CCIR	Indication	CH No. CCIR	Indication	CH No. CCIR	Indication
02	E2	L-:13	L-:08	28	U-:28	54	U-:67	74(S1)	L-:43
03	E3	L-:32	L-:21	29	U-:31	55	U-:68	75(S2)	L-:52
04	E4	L-:58	L-:33	30	U-:32	56	U-:70	76(S3)	L-:59
05	E5	H-:31	L-:44	31	U-:35	57	U-:71	77	L-:65
06	E6	H-:38	H-:48	32	U-:37	58	U-:72	78	L-:71
07	E7	H-:44	H-:51	33	U-:39	59	U-:73	79	L-:78
08	E8	H-:50	H-:54	34	U-:41	60	U-:75	80(M1)	L-:79
09	E9	H-:56	H-:56	35	U-:43	61	U-:76	81(M2)	L-:89
10	E10	H-:62	H-:59	36	U-:45	62	U-:77	82(M3)	H-:05
11	E11	H-:68	H-:61	37	U-:46	63	U-:78	83(M4)	H-:09
12	E12	H-:77	H-:64	38	U-:48	64	U-:80	84(M5)	H-:15
13(A)		L-:18		39	U-:50	65	U-:81	85(M6)	H-:21
14(B)		L-:33		40	U-:51	66	U-:83	86(M7)	H-:26
15(C)		L-:58		41	U-:53	67	U-:84	87(M8)	H-:31
16(D)		H-:44		42	U-:54	68	U-:87	88(M9)	H-:35
17(E)		H-:48		43	U-:55	69	U-:90	89(M10)	H-:40
18(F)		H-:53		44	U-:56			90(U1)	H-:65
19(G)		H-:56		45	U-:57			91(U2)	H-:68
20(H)		H-:59		46	U-:58			92(U3)	H-:70
21		U-:13		47	U-:59				
22		U-:15		48	U-:60				
23		U-:17		49	U-:62				
24		U-:20		50	U-:63				
25		U-:22		51	U-:64				
26		U-:24		52	U-:65				
27		U-:26		53	U-:66				

NOTE: The channels in the shaded sections in the above list are used exclusively for Switzerland and Belgium.

DISMANTLING

1. REMOVING THE CASE

1. Channel Preset Cover (Fig. 1)

1) Open the channel preset cover and pull out it upward.

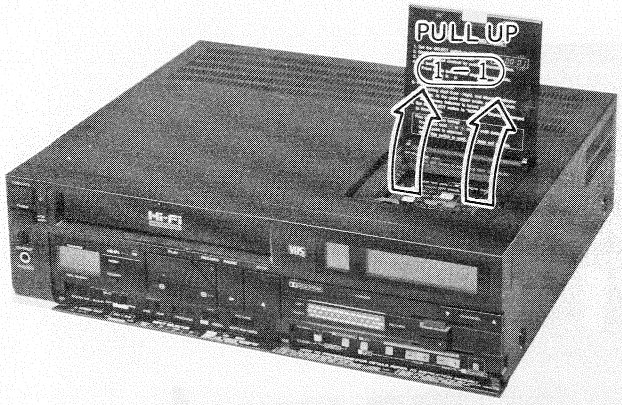


Fig. 1 Channel Preset Cover

2. Top Cover (Fig. 2)

1) Remove 5 top cover fixing screws.
2) Lift the rear of the top cover first and then lift the whole top cover to remove it.

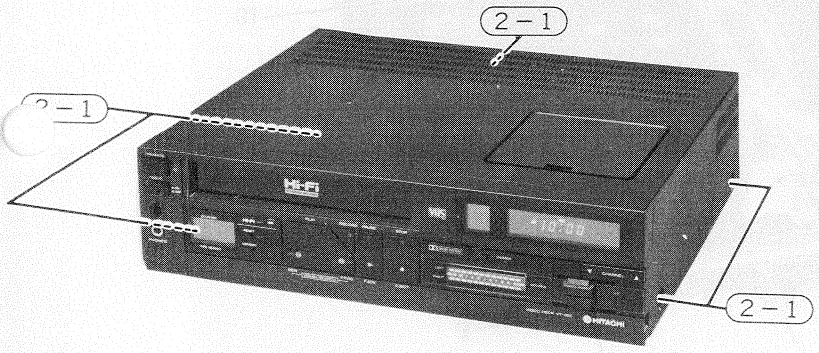


Fig. 2 Top Cover

3. Bottom Cover (Fig. 3)

1) Remove 8 bottom cover fixing screws.

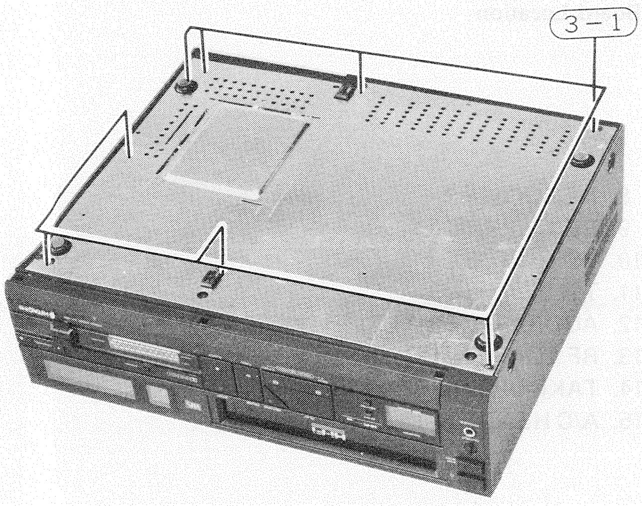


Fig. 3 Bottom Cover

4. Front Cover (Fig. 4)

1) Remove the top cover.
2) Remove 6 front cover fixing screws.
3) Release 3 fittings at the top of the front panel from the frame to remove the top of the front panel, and then remove the whole cover while taking care of the fitting at the bottom.

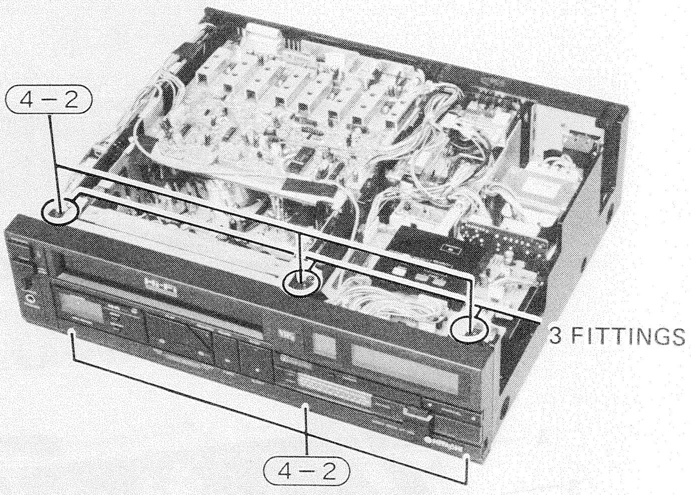


Fig. 4 Front Cover

5. Rear Cover (Fig. 5)

1) Remove the top cover.
2) Remove 4 rear cover fixing screws.

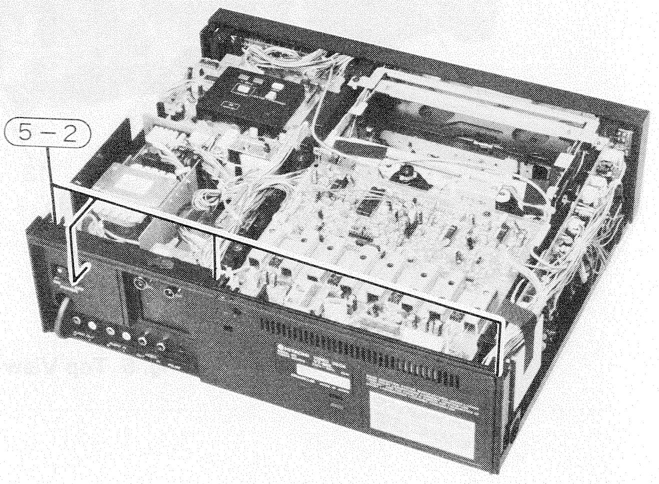


Fig. 5 Rear Cover

2. PC BOARD LOCATIONS

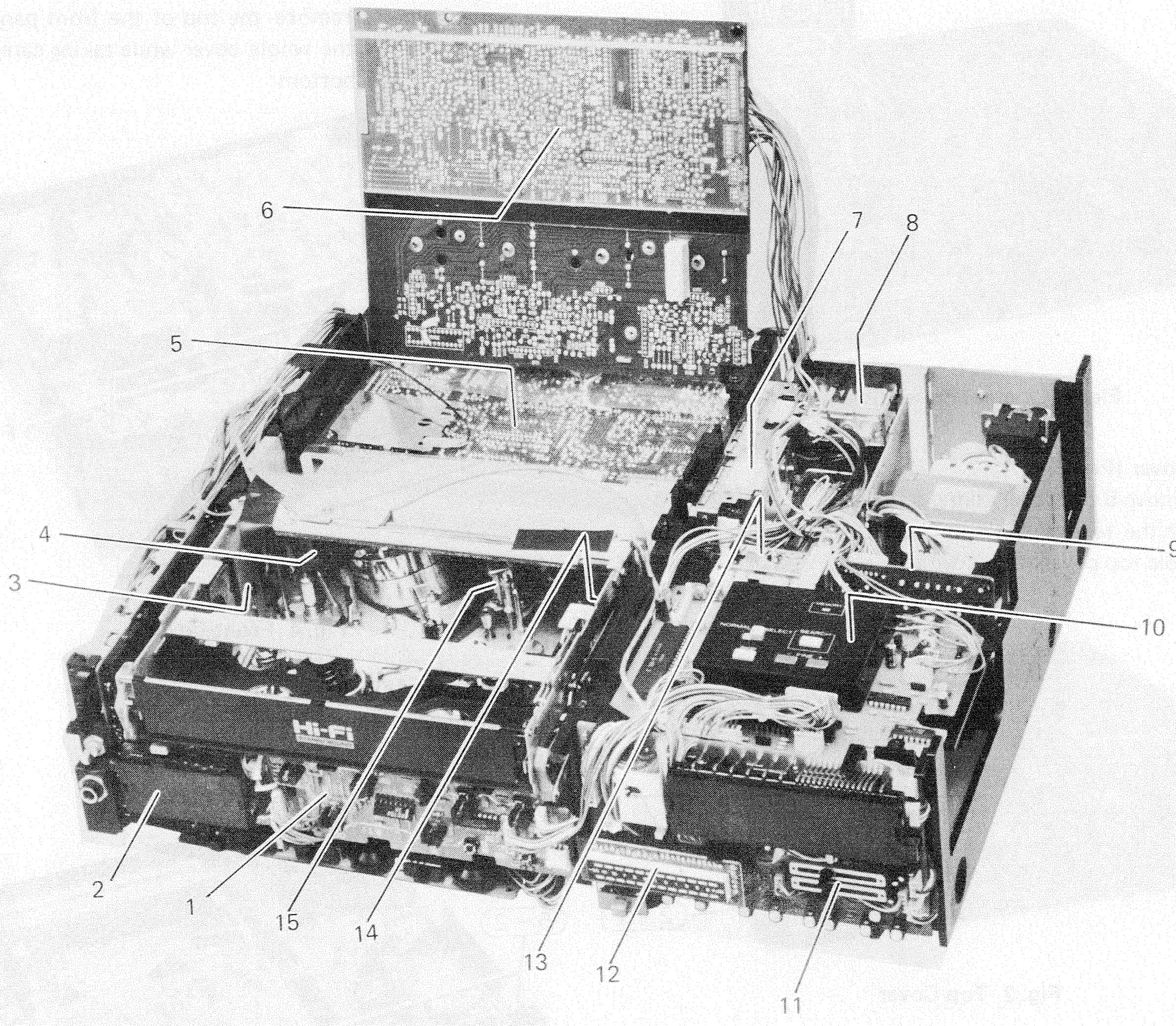


Fig. 6 Top View of PC Board Location

1. OPERATION SWITCH
2. TAPE COUNTER DISPLAY
3. SUPPLY END SENSOR
4. FULL ERASE HEAD
5. Y/CHROMA
6. REGULATOR/SERVO
7. TUNER/IF PACK
8. RF BOOSTER
9. RECTIFIER
10. VS TUNING
11. TIMER
12. AUDIO RECORD LEVEL INDICATOR
13. RF CONVERTER
14. TAKE-UP END SENSOR
15. A/C HEAD

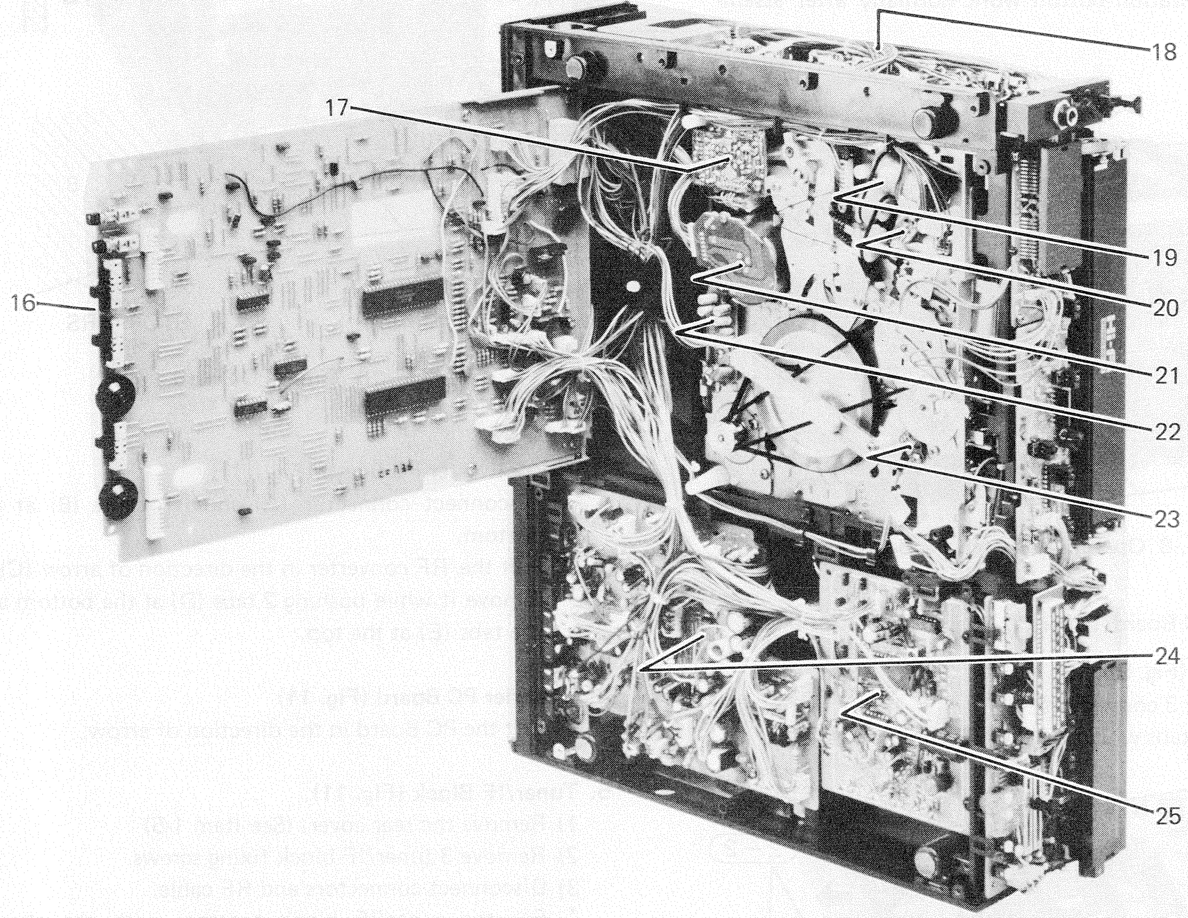


Fig. 7 Bottom View of PC Board Location

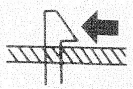
16. SYSTEM CONTROL
17. CYLINDER MOTOR DRIVER
18. AUDIO
19. LOADING MOTOR
20. SUPPLY REEL SENSOR
21. CYLINDER MOTOR
22. CAPSTAN MOTOR
23. TAKE-UP REEL SENSOR
24. JACK
25. MULTIPLEX DEMODULATOR [For E model]

3. REMOVING THE PC BOARDS

1. Operation Switch PC Board (Fig. 8)

1) Remove 2 operation switch PC Board fixing screws.
2) Remove the boards while releasing 4 tabs and pulling the board down.

* Assemble the operation switch PC Board in the reverse procedure to disassembly and check that all the operation button work normally after assembly.



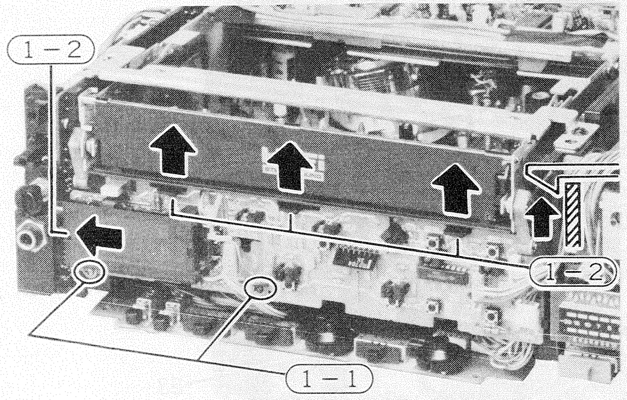


Fig. 8 Operation Switch PC Board

2. VS Tuning PC Board/Timer PC Board

[VS Tuning] (Fig. 9)

1) Disconnect 3 connectors.
2) Remove 3 tabs which fix the VS Tuning PC Board.

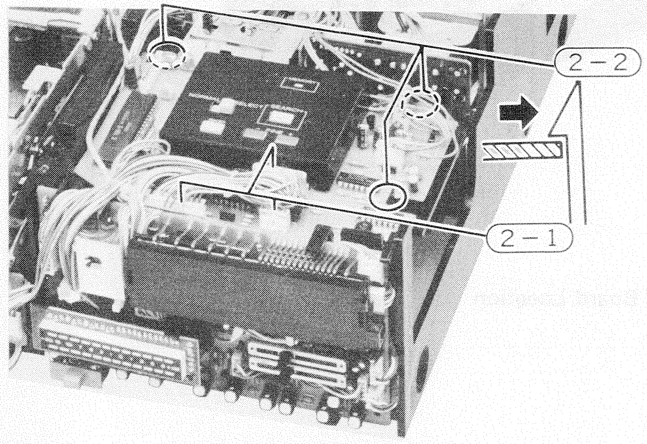


Fig. 9 VS Tuning PC Board

[Timer] (Fig. 10)

3) Remove 2 tabs at the top of the board and then pull the timer upward.

* Fit the board to 3 stoppers at the bottom of the board to fix the board when installing it.

[Level Meter] (Fig. 10)

4) Remove 4 tabs on the meter and then remove it.

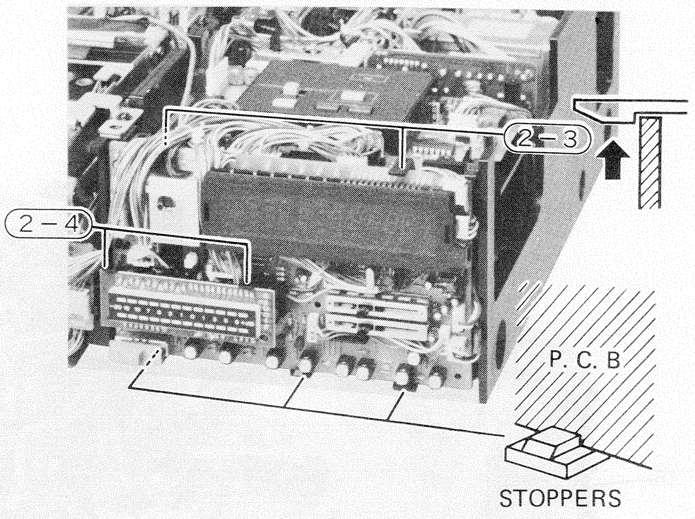


Fig. 10 Timer PC Board

3. RF Converter PC Board (Fig. 11)

1) Disconnect connector (A) and RF cable (B) at the bottom.
2) Pull the RF converter in the direction of arrow (C) to remove it while pushing 2 tabs (D) at the bottom and the tabs (E) at the top.

4. Rectifier PC Board (Fig. 11)

1) Lift the PC Board in the direction of arrow.

5. Tuner/IF Block (Fig. 11)

1) Remove the rear cover. (See Item 1-5)
2) Remove 3 tuner/IF block fixing screws.
3) Disconnect connectors and RF cable.

* Fix the tuner/IF block together with the chassis GND using screws near the transformer.

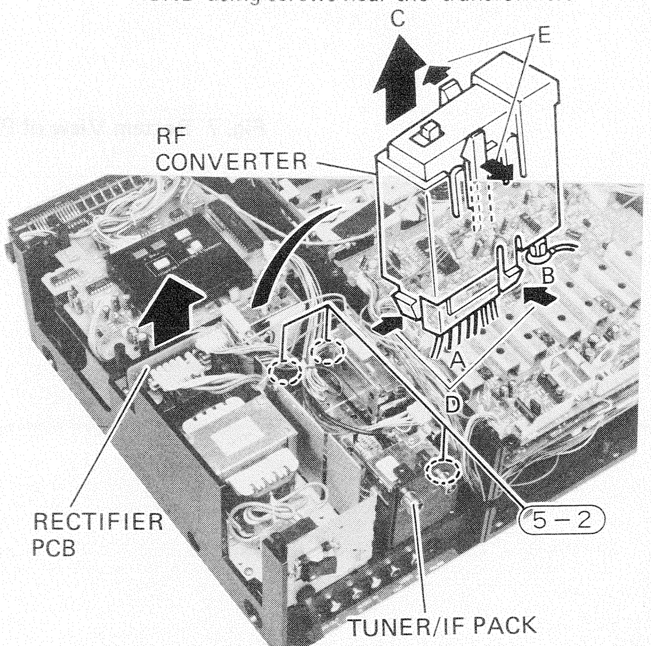


Fig. 11 RF Converter Tuner/IF Block, Rectifier PC Board

6. Regulator/Servo PC Board (Fig. 12)

1) Release the cord from the groove of the case on both sides of the board.
2) Remove the regulator/servo board fixing screw and lift the front of the board.

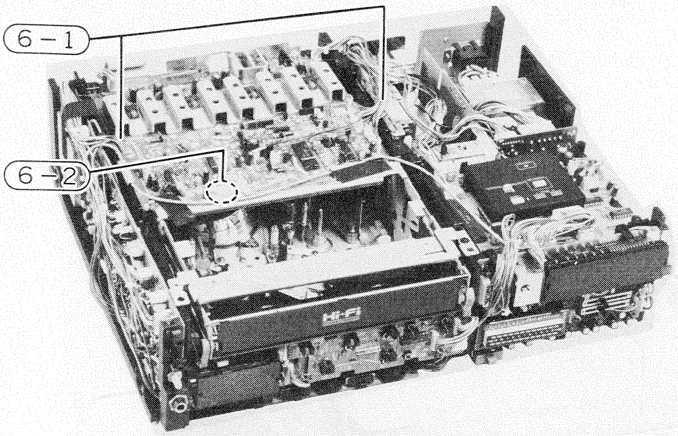


Fig. 12 Regulator/Servo PC Board

7. Y/Chroma PC Board (Fig. 13)

1) Remove the regulator/servo PC Board. (See Item 6)
2) Remove the earth connector.
3) Lift the front of the board while removing 2 tabs.

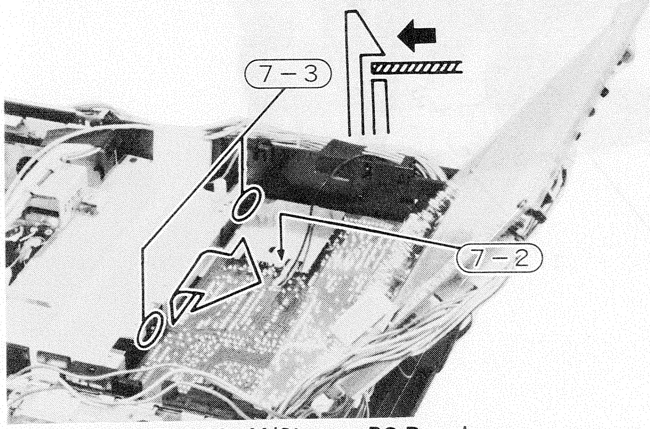


Fig. 13 Y/Chroma PC Board

8. Jack PC Board (Fig. 14)

1) Remove 2 jack PC Board fixing screws.
2) Release 2 stoppers.

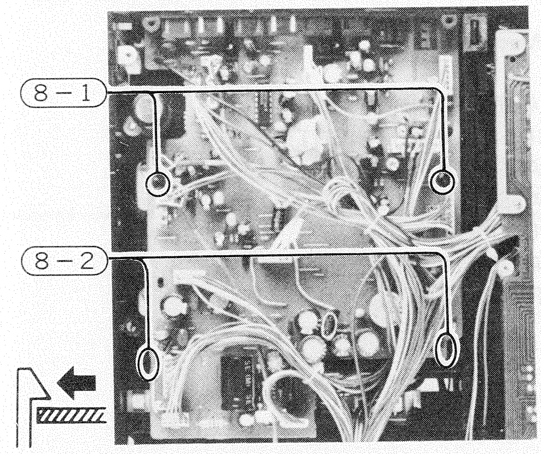


Fig. 14 Jack PC Board

9. Audio PC Board (Fig. 15)

1) Remove the front cover. (See Item 1-4)
2) Remove 2 audio PC Board fixing screws.

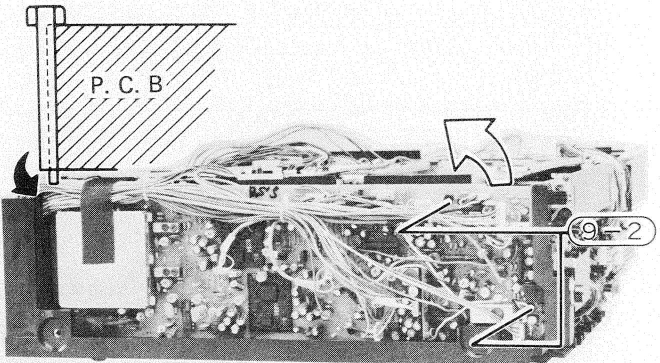


Fig. 15 Audio PC Board

11. System Control PC Board (Fig. 16)

1) Remove 2 system control PC Board fixing screws.
2) Disconnect 4 connectors from the Operation switch PC Board.
3) Pull the right of the board and open it toward the left.

12. Multiplex Demodulator PC Board (Fig. 16)

1) Remove 3 multiplex demodulator PC Board fixing screws.

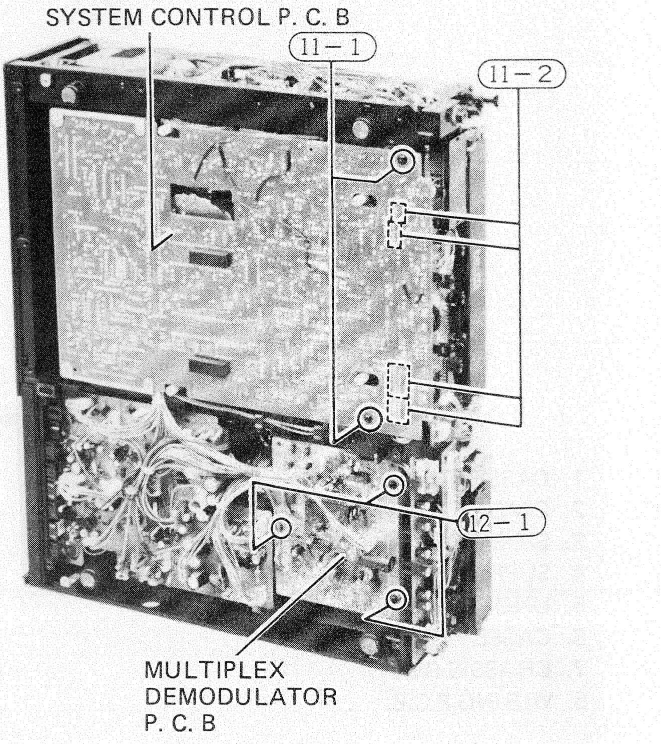


Fig. 16 System Control PC Board

4. CASSETTE LOADING MECHANICAL PARTS LOCATIONS

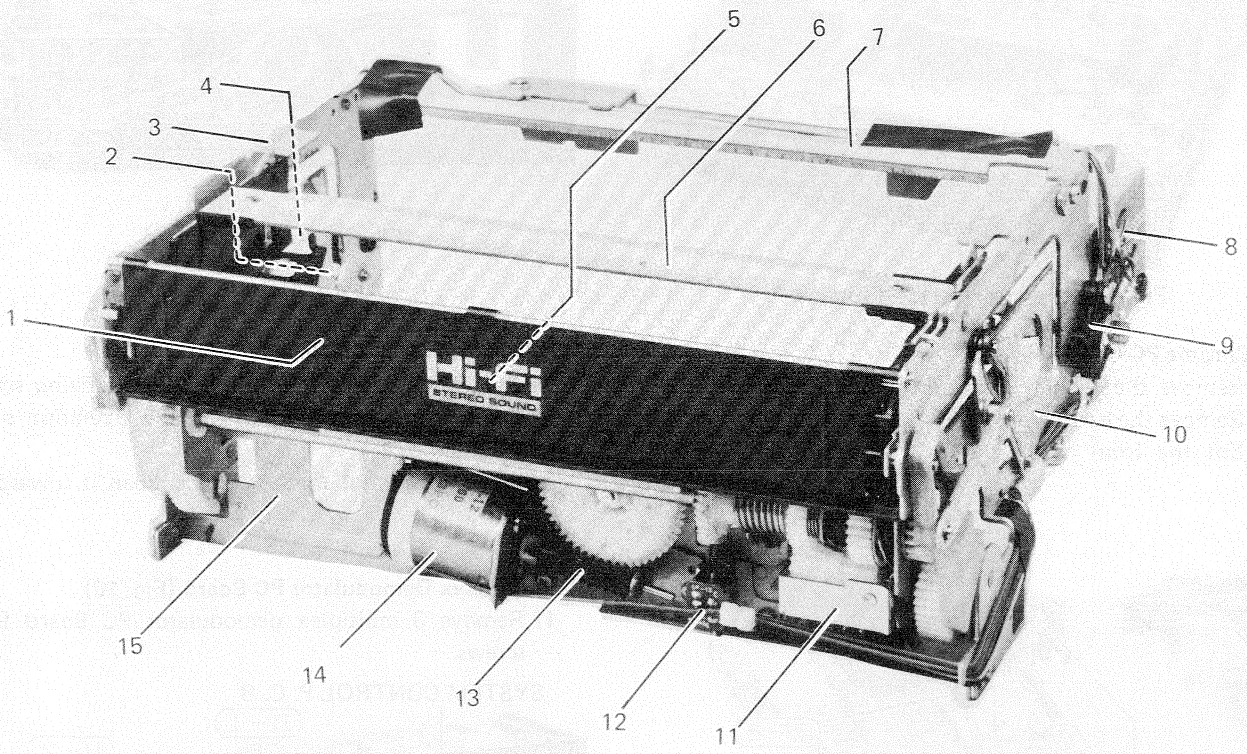


Fig. 17 Cassette Loading Mechanism

1. CASSETTE DOOR
2. CASSETTE DOWN SWITCH
3. SIDE CHASSIS (LEFT)
4. SUPPLY END SENSOR P.C.B.
5. UNDER GUIDE
6. CASSETTE HOLDER
7. CHASSIS ROOF
8. WIRING P.C.B.
9. TAKE UP END SENSOR P.C.B.
10. SIDE CHASSIS (RIGHT)
11. CASSETTE IN SWITCH P.C.B.
12. CASSETTE UP SWITCH P.C.B.
13. WORM GEAR
14. CASSETTE LOADING MOTOR
15. FRONT CHASSIS

5. REMOVING THE CASSETTE LOADING MECHANICAL PARTS

1. Cassette Loading Mechanism (Figs. 18, 19)

1) Remove the Regulator/Servo PC Board. (See Fig. 12)
2) Remove the Y/Chroma PC Board. (See Fig. 13)
3) Lift the left side of the shield cover to release engagement with the case on the right and remove the shield cover.

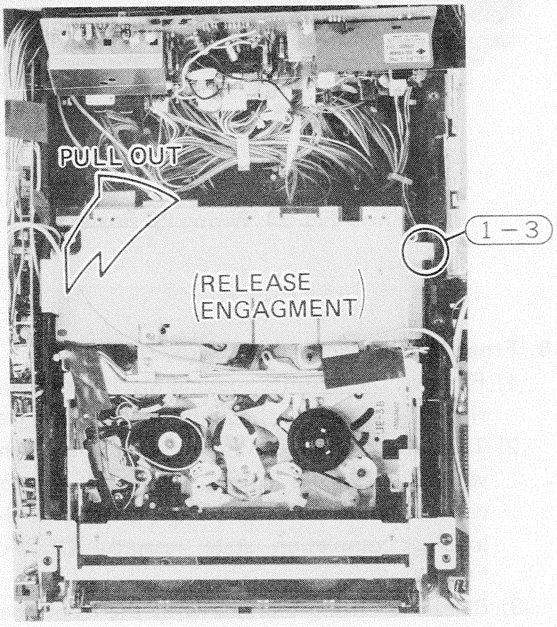


Fig. 18 Shield Cover

4) Disconnect 9P connector from the wiring board.
5) Remove reinforcing plate fixing screw.
6) Remove 2 cassette loading mechanism fixing screws and lift the rear of the holder to release the fitting at the front.

* Install the cassette loading mechanism by the reverse procedure.

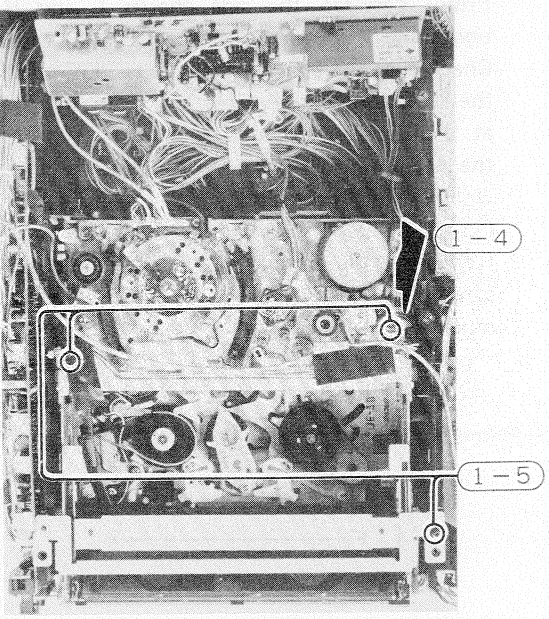


Fig. 19 Cassette Loading Mechanism

2. Supply and Take-up End Sensors (Figs. 20, 21)

1) Remove the cassette loading mechanism. (See Item 1)
2) Remove each end sensor fixing screw to remove the sensors.

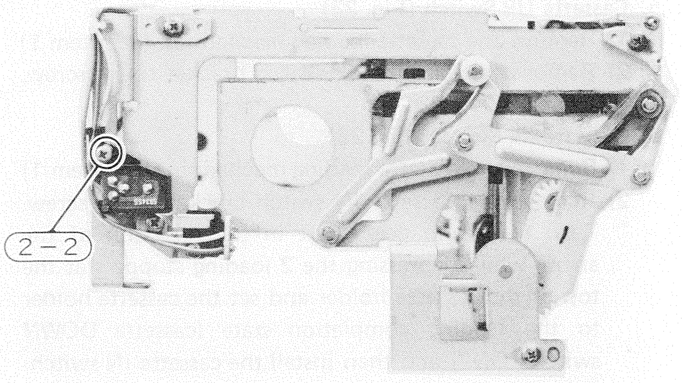


Fig. 20 Take-up End Sensor

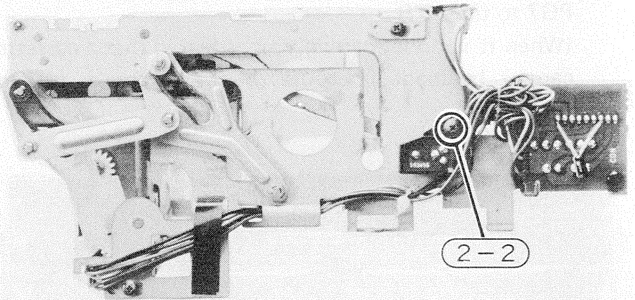


Fig. 21 Supply End Sensor

3. Cassette DOWN Switch (Fig. 22)

1) Remove the cassette loading mechanism. (See Item 1)
2) Remove the cassette DOWN switch bracket fixing screws.
3) Remove the cassette DOWN switch fixing screw.

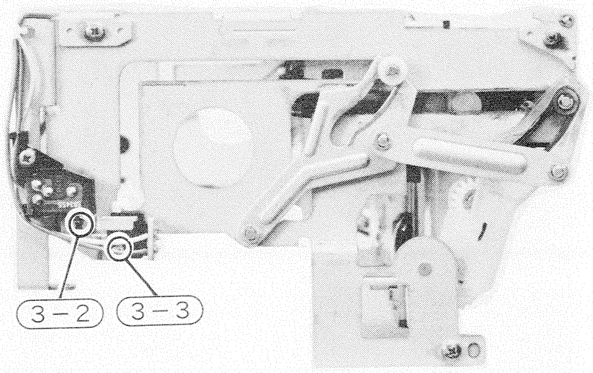


Fig. 22 Cassette Down Switch

4. Cassette Loading Motor (Fig. 23)

1) Remove the cassette loading mechanism. (See Item 1)
2) Remove 3 cassette loading motor bracket fixing screws.

5. Cassette UP Switch (Fig. 23)

1) Remove the cassette loading mechanism. (See Item 1)
2) Remove the cassette UP switch bracket fixing screw.

6. Cassette IN Switch (Fig. 23)

1) Remove the cassette loading mechanism. (See Item 1)
2) Remove the Cassette IN switch bracket fixing screw.

* Turn the worm gear shaft in the direction of the arrow while depressing the 2 loading stoppers at the top of the cassette holder and set the cassette holder to the loading completion state (cassette DOWN switch "ON") and then install the cassette IN switch. (See Fig. 25)

Tighten the cassette IN switch with screws so that the switch lever pushes the switch knob completely to its depth and the lever is not pushed back by the switch. Unload the cassette holder electrically by connecting PG7 to the VTR.

(When it is done manually, it is feared that a cassette cannot be loaded because the worm gear is turned too much.)

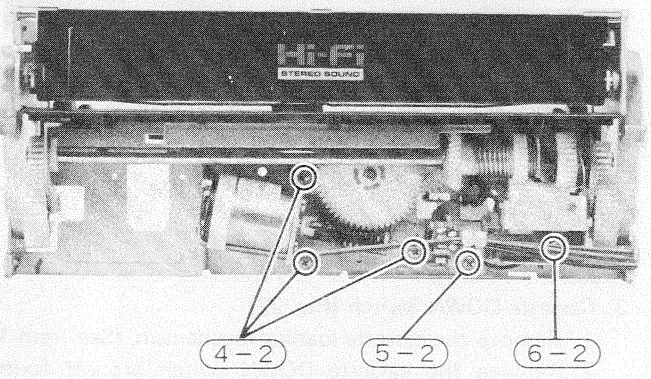


Fig. 23 Cassette Loading Motor, Cassette IN and UP Switches

7. Wiring PC Board (Fig. 24)

1) Remove the cassette loading mechanism. (See Item 1)
2) Remove 2 nylon rivets which fix the wiring board.

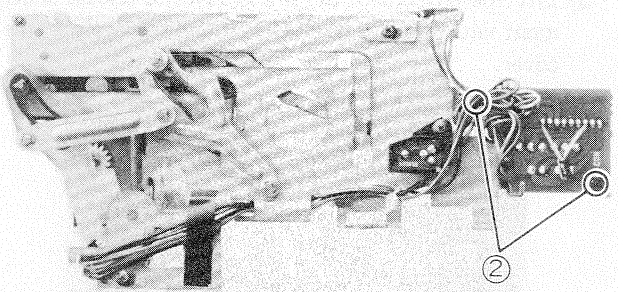


Fig. 24 Wiring PC Board

8. Front Chassis Removal (Figs. 25, 26, 27)

1) Remove the cassette loading mechanism while referring to "Cassette Loading Mechanism Removal".
2) Turn the worm gear in the direction of the arrow while depressing 2 loading stoppers at the top of the cassette holder so as to set the cassette holder to the loading completion state (cassette DOWN switch "ON").
3) Release 3 fitting sections with the front chassis and then remove the under-guide.
4) Remove the cassette door bracket fixing screw and E ring to remove the cassette door.
5) Remove 4 front chassis fixing screws.

* Reinstall the front chassis in the reverse procedure to disassembly while taking care of the following. Match markings of the pinion gear in the front chassis and the arm gear in the side chassis when installing the front chassis to the side chassis (L/R). (See Fig. 27). Install the cassette door first and fit the door shaft firmly between the side chassis L and R before tightening 2 screws at the top of the front chassis. Check that the guard arm shaft is fully positioned in the direction of the arrow and match the projection at the back of the under-guide with the groove in the front chassis before installing the under-guide. Unload the cassette holder electrically by connecting PG7 to the VTR.

(When it is done manually, it is feared that a cassette cannot be loaded because the worm gear is turned too much.)

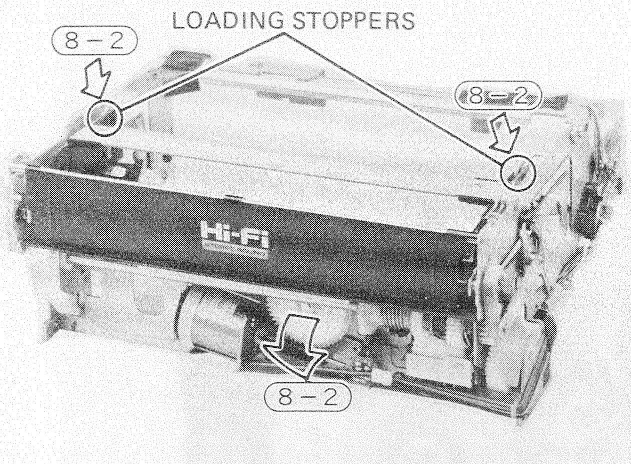


Fig. 25 Front Chassis

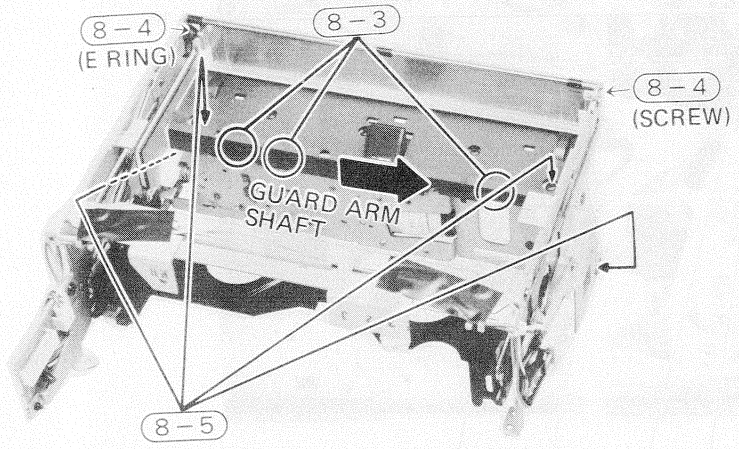


Fig. 26 Front Chassis

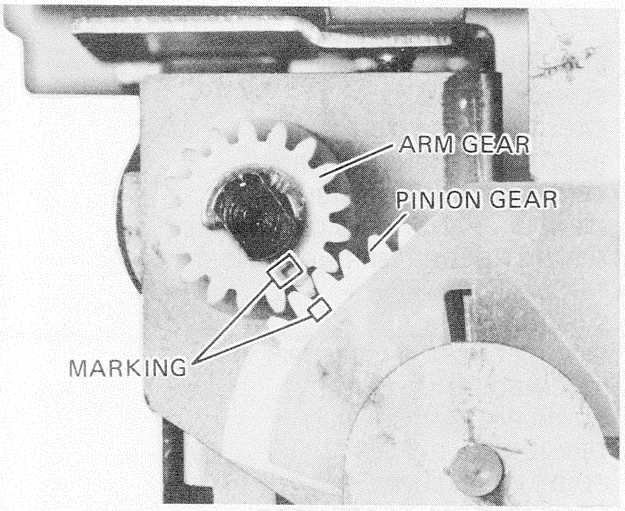


Fig. 27 Gear Marking

9. Side Chassis (L/R) Removal (Fig. 28)

1) Remove the cassette loading mechanism while referring to "Cassette Loading Mechanism Removal".
2) Remove the front chassis while referring to "Front Chassis Removal".
3) Remove 2 chassis roof fixing screws to remove the chassis roof.
4) Remove the cassette door bracket fixing screw and E ring to remove the cassette door.
5) Remove E rings (2 each for left/right) and collars (2 each for left and right).

* Reinstall the side chassis (L/R) in the reverse procedure to disassembly while taking care of the size of the collars.

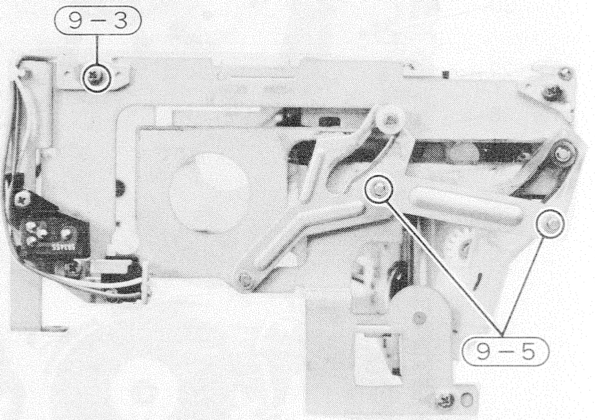


Fig. 28 Side Chassis (L/R)

10. Cassette Holder Removal

1) Remove the cassette loading mechanism while referring to "Cassette Loading Mechanism Removal".
2) Remove the front chassis while referring to "Front Chassis Removal".
3) Remove the side chassis (L/R) while referring to "Side Chassis (L/R) Removal".
4) Remove the cassette holder.

* Reinstall the cassette holder in the reverse procedure to disassembly.

* Turn the worm gear shaft in the direction of the arrow while depressing the 2 loading stoppers at the top of the cassette holder and set the cassette holder to the loading completion state (cassette DOWN switch "ON") and then install the cassette IN switch. Tighten the cassette IN switch with screws so that the switch lever pushes the switch knob completely to its depth and the lever is not pushed back by the switch. Unload the cassette holder electrically by connecting PG7 to the VTR.
(When it is done manually, it is feared that a cassette cannot be loaded because the worm gear is turned too much).

6. MAIN CHASSIS PARTS LOCATIONS

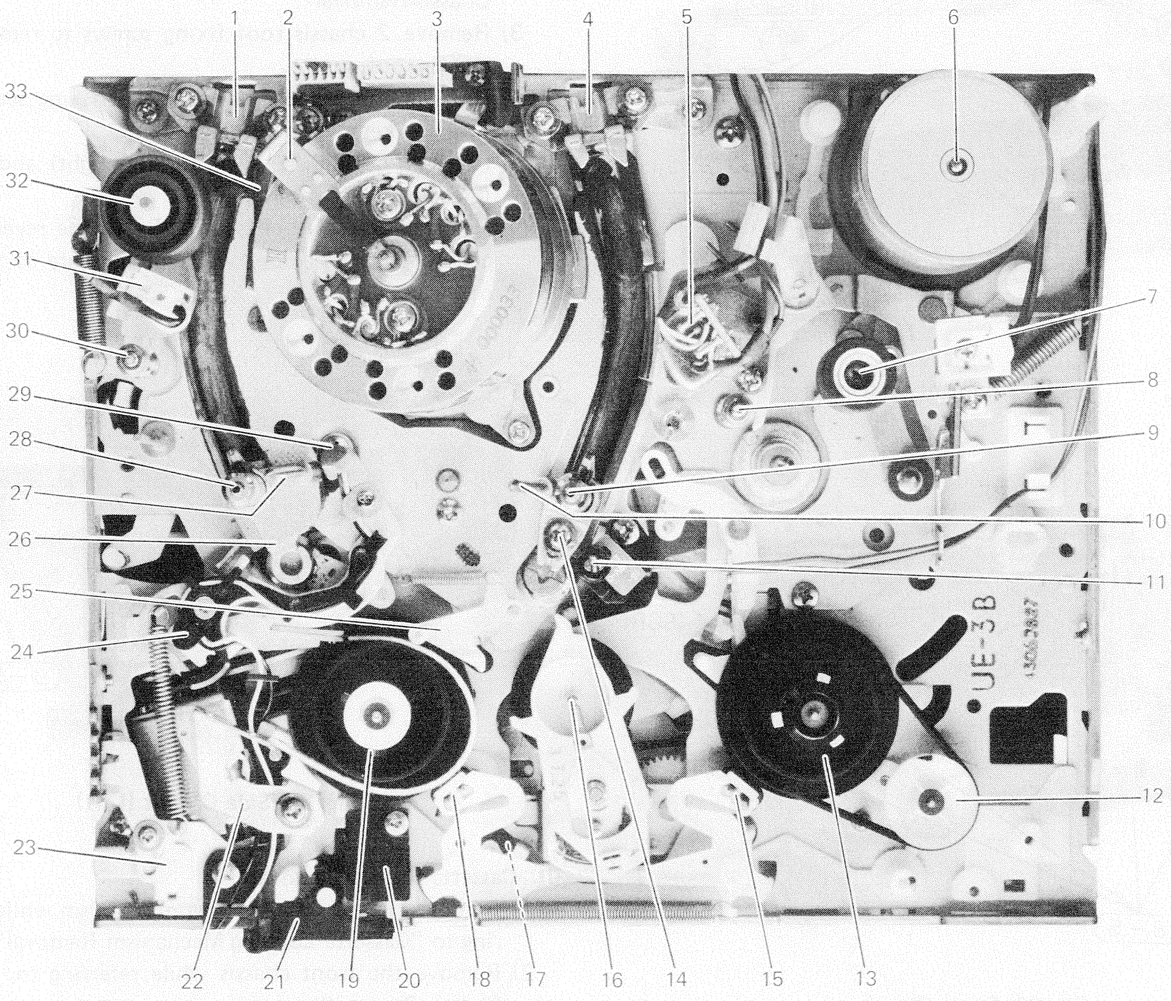


Fig. 29 Top View

1. CATCHER (SUPPLY)
2. CYLINDER MOTOR BRUSH
3. VIDEO HEAD (UPPER CYLINDER)
4. CATCHER (TAKE-UP)
5. A/C HEAD (AUDIO/CONTROL HEAD)
6. CAPSTAN MOTOR
7. PRESSURE ROLLER
8. GUIDE POLE (TAKE-UP)
9. GUIDE ROLLER (TAKE-UP)
10. INCLINED GUIDE (TAKE-UP)
11. END LAMP
12. LOAD PULLEY
13. TAKE-UP REEL DISK
14. GUIDE ROLLER BASE (TAKE-UP)
15. MAIN BRAKE (TAKE-UP)
16. REEL DRIVE IDLER
17. BRAKE CONVERSION ARM
18. MAIN BRAKE (SUPPLY)
19. SUPPLY REEL DISK
20. SAFETY TAB SWITCH
21. RECORD PREVENTION ARM
22. TENSION BAND ASSEMBLY
    (TENSION BAND‘ TENSION BRACKET)
23. SPRING HOLDER (SPRING HANGER)
24. TENSION ARM
25. SUB-BRAKE
26. GUIDE ROLLER BASE (SUPPLY)
27. INCLINED GUIDE (SUPPLY)
28. GUIDE ROLLER (SUPPLY)
29. TENSION POLE
30. GUIDE POLE (SUPPLY)
31. FE HEAD (FULL ERASE HEAD)
32. IMPEDANCE ROLLER
33. GUIDE BASE FIXING PLATE

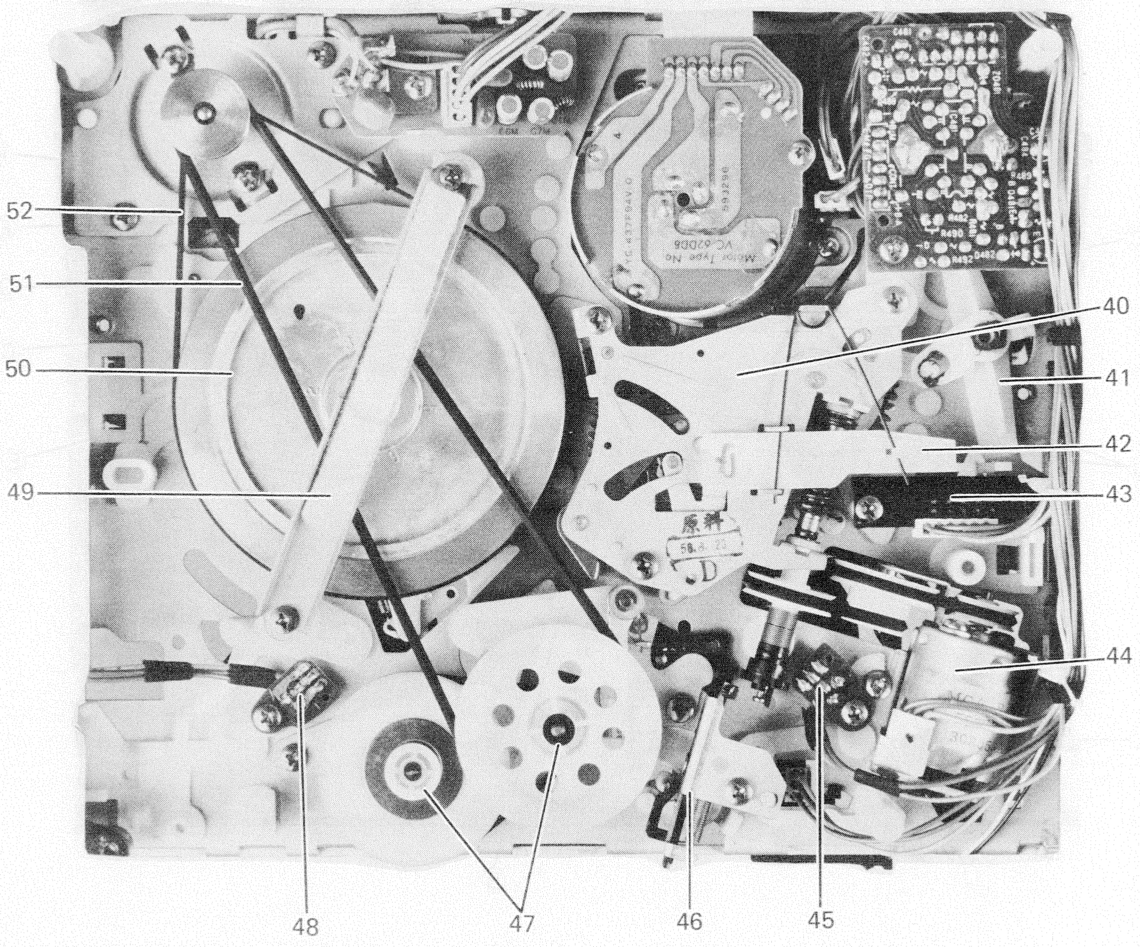


Fig. 30 Bottom View

40. LOADING GEAR ASSEMBLY
41. TENSION RELEASE ARM
42. SWITCH SLIDER
43. MECHANISM STATE SWITCH
44. LOADING MOTOR
45. REEL SENSOR (SUPPLY)
46. BRAKE SLIDER
47. CLUTCH PLATE ASSEMBLY
48. REEL SENSOR (TAKE UP)
49. FLYWHEEL SUPPORT PLATE
50. CAPSTAN FLYWHEEL
51. REEL BELT
52. FLYWHEEL BELT

BEFORE DISASSEMBLING PARTS

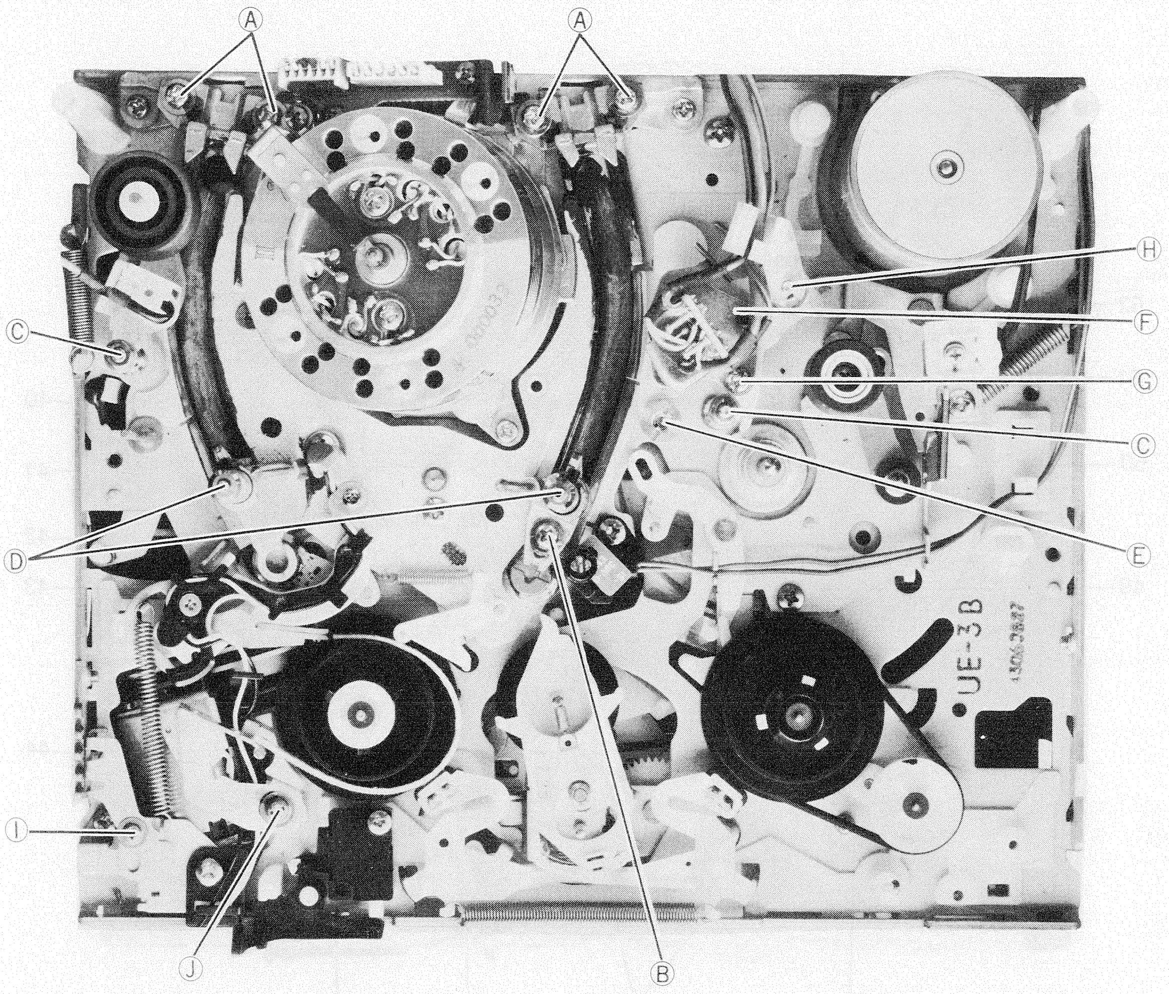


Fig. 31

The parts shown below are fixed in the factory using precision jigs so be sure not to loosen their screws or remove them.

Ⓐ Take-up/supply catchers and fixing screws.
Ⓑ Inclined guide and its fixing screw.
Do not turn the adjusting screws shown below when removing adjacement parts.
Ⓒ Take-up/supply guide pole height adjusting nut.
Ⓓ Take-up/supply guide roller height adjusting nut.
Ⓔ AC head X value adjusting screw.
Ⓕ AC head tilt adjusting screw.
Ⓖ AC head azimuth adjusting screw.
Ⓗ AC head height adjusting nut.
Ⓘ Back tension adjusting spring holder fixing screw.
Ⓙ Tension band fixing screw.

7. REMOVING THE MAIN ELECTRICAL PARTS

1. Cylinder Assembly
2. Full Erase Head
3. Audio Control Head

1. Video Head (Fig. 32)

1) Remove the shield cover while referring to "Cassette Loading Mechanism Removal".
2) Remove the screw to remove the board holder.
3) Remove the screw to remove the cylinder motor brush.
4) Remove two connectors of the video head P.C.B. and three connectors under the cylinder.
5) Remove the connector from the cylinder P. C. B.
6) Remove cylinder assembly to remove three cylinder assembly fixing screws.

* Be careful that your fingers or tools do not touch the video head tips during work.
Install the cylinder assembly by the reverse procedure. Adjust as follows after installing.

- Head Switching Point Adjustment
- Tracking Preset Adjustment
- Record Luminance and Chroma Level Adjustments

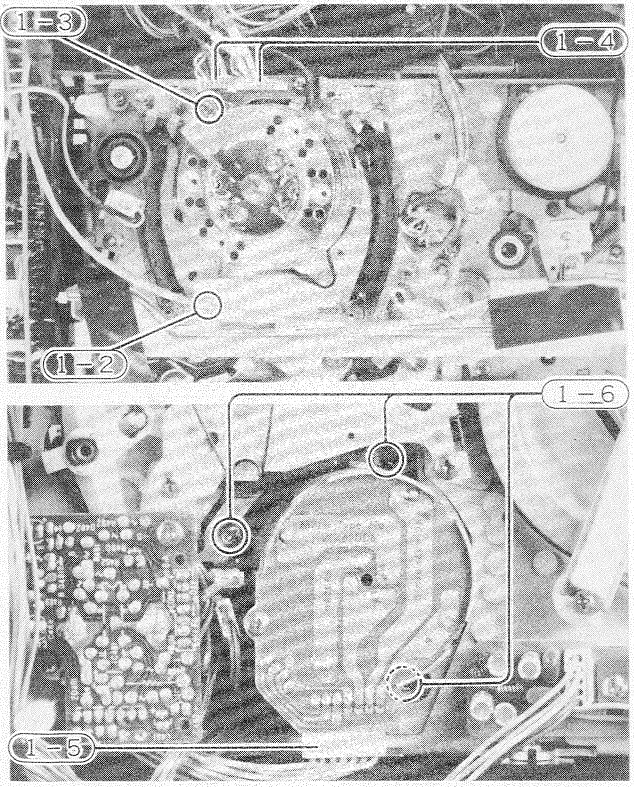

1－3
1－4
1－2
1－6
1－5

Fig. 32 Cylinder Assembly

2. Full Erase Head [FE Head] (Fig. 33)

1) Remove the shield cover while referring to "Cassette Loading Mechanism Removal".
2) Remove the spring between the FE head base and the chassis.
3) Remove the guide pole fixing nut to take out the guide pole, spring and washer.
4) Take out the FE head base and then remove the FE head fixing screw at the back of the base.

* Install the full erase head by the reverse procedure.
. Adjust the guide pole height after installation.

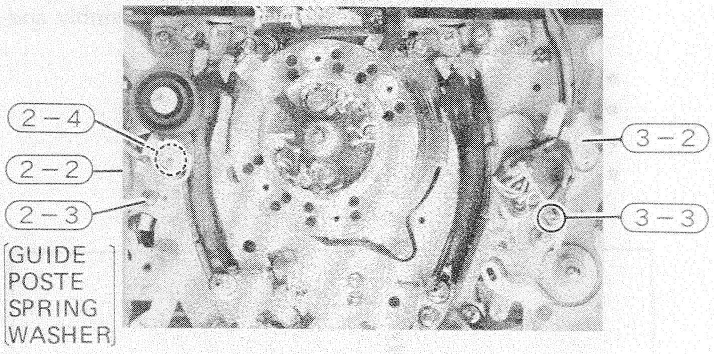

2－4
2－2
2－3
GUIDE POSTE SPRING WASHER
3－2
3－3

Fig. 33 FE Head, A/C Head

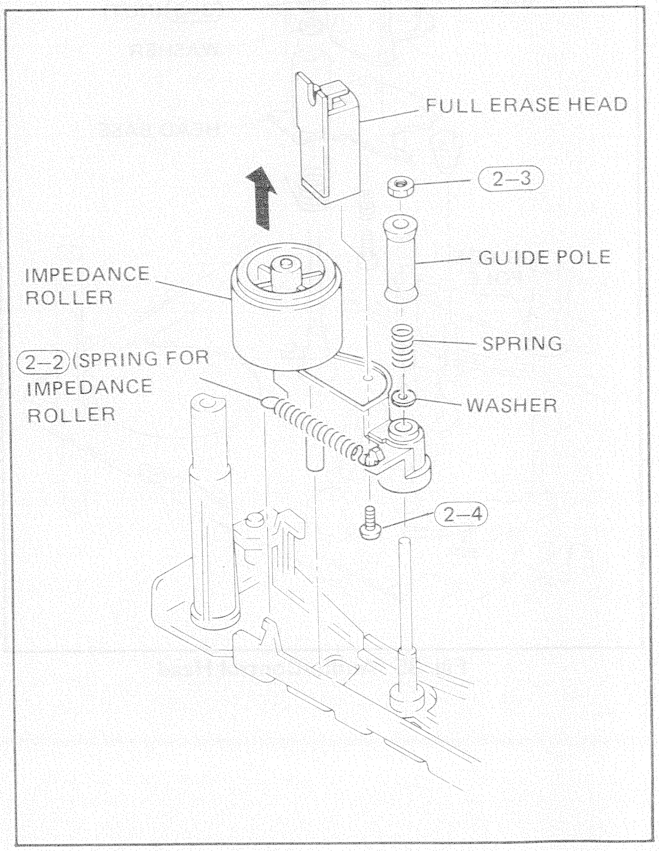

FULL ERASE HEAD
2–3
GUIDE POLE
IMPEDANCE ROLLER
SPRING
2–2 (SPRING FOR IMPEDANCE ROLLER
WASHER
2–4

Fig. 34 Full Erase Head

3. Audio/Control Head Removal [AC Head] (Figs. 33, 35, 36)

1) Remove the shield cover while referring to "Cassette Loading Mechanism Removal".
2) Remove the cord clamp.
3) Remove the A/C head fixing nut and washer to take out the A/C head assembly.

* Install the audio/control head by the reverse procedure. Fit the bottom of the spring under A/C head base to the chassis and the top to the stopper on the base. Check that the tip of the head base fixing screw is approx. 3 – 4 mm above the top of the base after installing the A/C head assembly and then adjust as follows.

- A/C Head Height Adjustment
- A/C Head Tilt Adjustment
- A/C Head Azimuth Adjustment
- A/C Head Position Adjustment

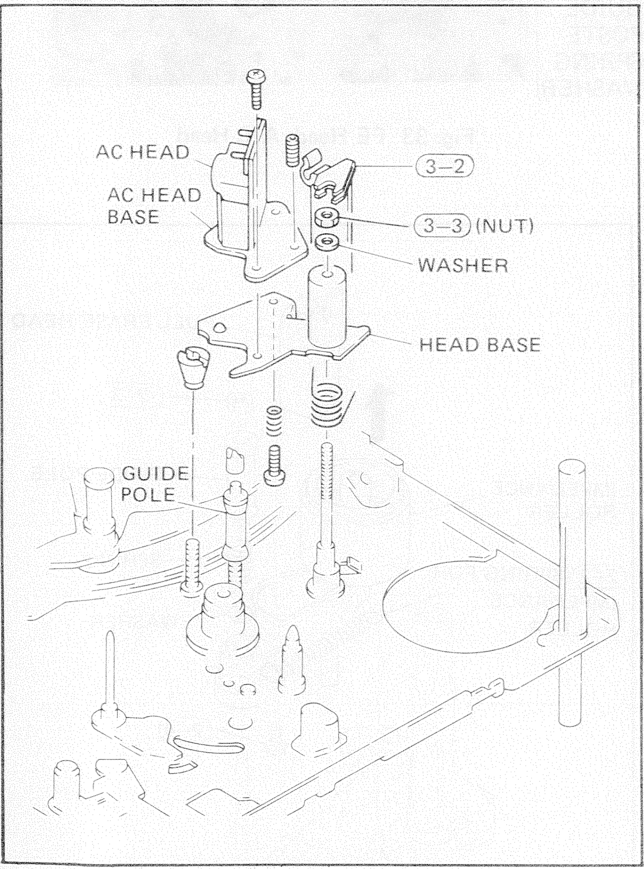


Fig. 35 Audio/Control Head

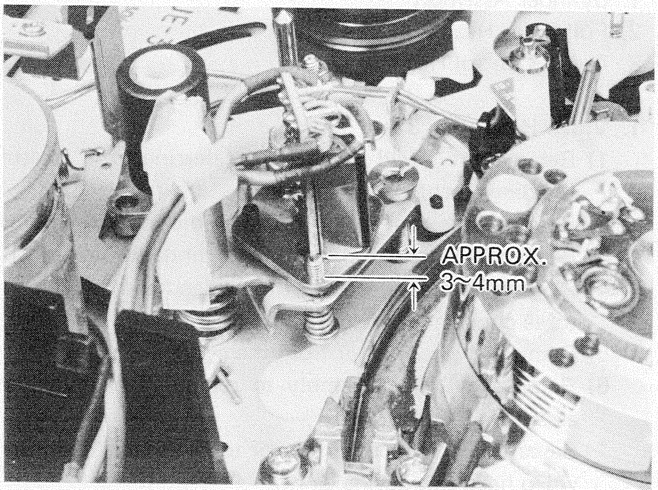


Fig. 36 Audio/Control Head

8. REMOVING THE MAIN MECHANICAL PARTS

1. Cylinder Motor
2. Loading Motor
3. Capstan Motor
4. Supply and Take-up Main Brakes
5. Sub Brake
6. Tension Band and Tension Arm
7. Supply Reel Disk
8. Take-up Reel Disk
9. Load Pulley
10. Reel Drive Idler
11. Safety Tab Switch
12. End Lamp
13. Pressure Roller
14. Pressure Roller Arm Bracket
15. Clutch Plate Assembly
16. Brake Slider
17. Capstan Flywheel
18. Mechanism State Switch
19. Reel Sensor
20. Supply and Take-up Loading Arms
21. Loading Gear Assembly

1. Cylinder Motor

1) Remove the system control PC Board while referring to "System Control PC Board Removal".

[Cylinder Motor PC Board] (Fig. 37)

2) Remove the cylinder motor PC Board fixing screw.
3) Turn the board clockwise to release it fitting with the motor case.

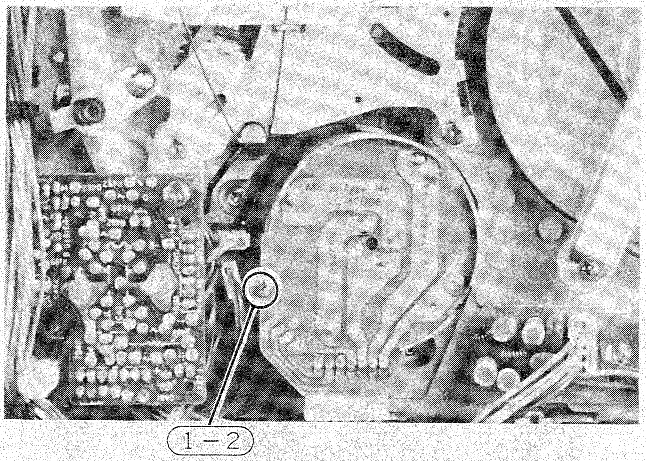


Fig. 37 Cylinder Motor PC Board

[Cylinder FG PC Board] (Figs. 38, 39)

4) Remove the motor case fixing screw.
5) Turn the case clockwise, release the fitting with the cylinder and remove the case.
6) Remove 2 rotor magnet fixing screws to remove the rotor magnet. Do not allow the rotary magnet to be attracted by other magnetic or iron materials because it is magnetized with high precision to maintain the precise rotation of the motor. When it is attracted by mistake, there is danger that its magnetization may be changed. Pay special attention in handling the FG signal generating magnet installed on the back of the rotary magnet because it has 60 poles and their magnetic force is weak.
7) Remove 3 cylinder FG board fixing screws.

* Install the cylinder motor by the reverse procedure.

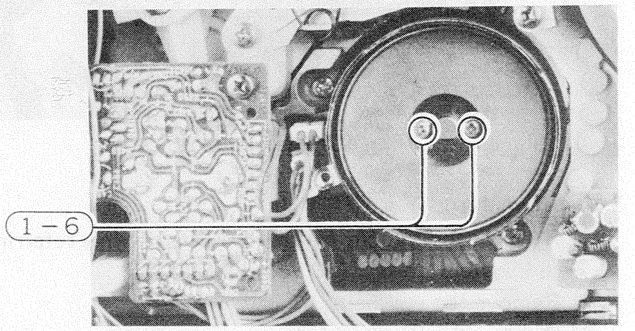


Fig. 38 Cylinder Motor (Rotor Magnet)

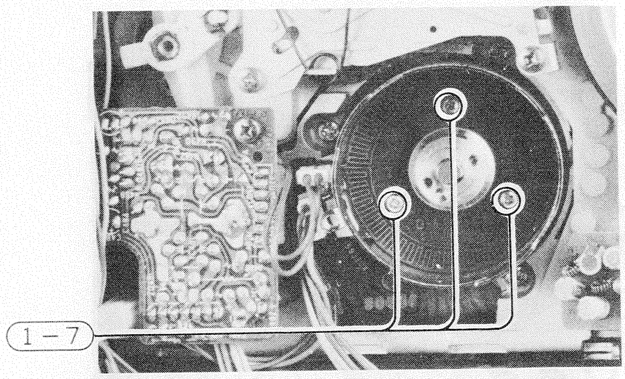


Fig. 39 Cylinder Motor (Cylinder FG PC Board)

2. Loading Motor (Fig. 40)

1) Remove the system control PC Board while referring to "System Control PC Board Removal".
2) Remove the loading belt.
3) Remove the loading motor fixing screw.
* Fit the groove in the chassis and the stopper on the bracket to install the loading motor and then fix it using screws.

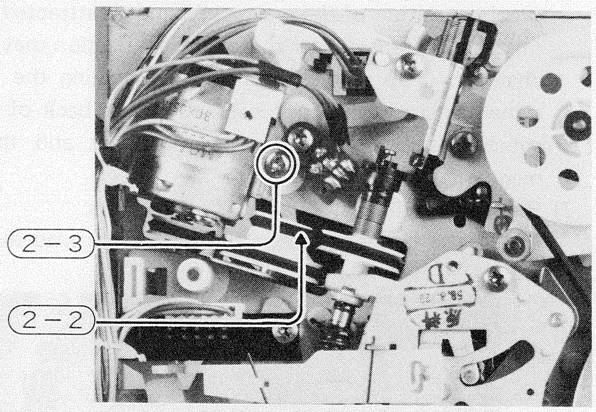


Fig. 40 Loading Motor

3. Capstan Motor (Fig. 41)

1) Remove the system control PC Board while referring to "System Control PC Board Removal".
2) Remove the reel belt.
3) Remove the flywheel belt.
4) Remove 2 capstan motor bracket fixing screws.
* Install the capstan motor by the reverse procedure. Confirm the reference oscillation frequency Adjustment after installation.

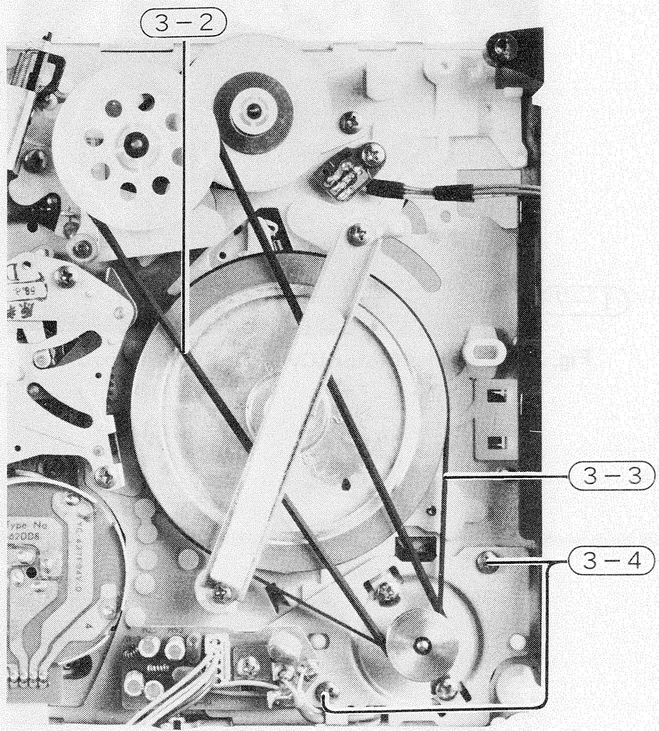


Fig. 41 Capstan Motor

4. Supply and Take-up Main Brakes (Fig. 42)

1) Remove the springs between the supply brakes and take-up brakes.
2) Release the fitting with the chassis.

5. Sub Brake (Fig. 42)

1) Remove the spring between the sub chassis and brake.
2) Release the fitting with the brake shaft.

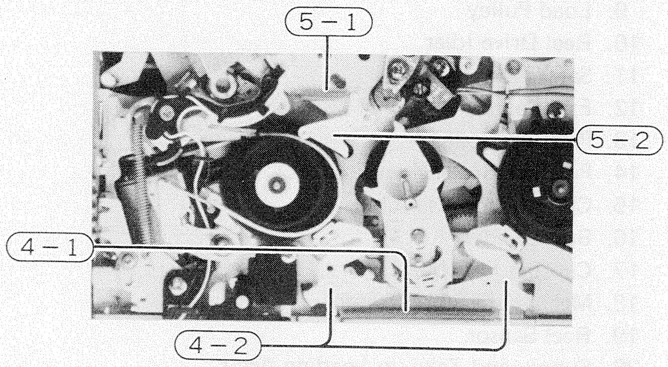


Fig. 42 Main and Sub Brakes

6. Tension Band and Tension Arm (Fig. 43)

1) Remove the springs between the tension arm and spring holder.
2) Remove the tension band fixing screw.
3) Release the fitting with the tension arm to pull out the tension band and the tension arm.
* Install the tension band and tension arm by the reverse procedure.

- Adjust as follows after installation.
- Tension Arm Position Adjustment
- Back Tension Adjustment

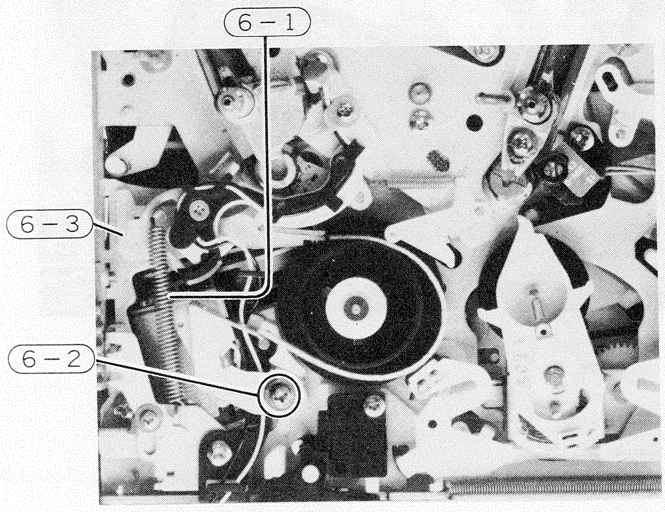


Fig. 43 Tension Band and Tension Arm

7. Supply Reel Disk (Fig. 44)

1) Remove the tension arm and tension band. (See Item 6.)
2) Remove the sub brake. (See Item 5.)
3) Remove the washer at the top of the reel disk.

* The bearing and spacer are inserted between the reel disk and chassis. Check them before installing the supply reel disk.

* Use new retaining washer for reel disk when reinstalling.

8. Take-up Reel Disk (Fig. 44)

1) Remove the belt between the reel disk and the load pulley.
2) Remove the washer at the top of the reel disk.

* The spacer is inserted between the reel disk and the chassis. Check it before installing the take-up reel disk.

* Use new retaining washer for reel disk when reinstalling.

9. Loading Pulley (Fig. 44)

1) Remove the belt between the load pulley and the reel disk.
2) Remove the washer at the top of the load pulley.

* Use new retaining washer for load pulley when reinstalling.

10. Reel Drive Idler (Fig. 44)

1) Pull the spring holder toward you to release its fitting with the reel drive idler arm shaft and then pull out the idler upward.

11. Safety Tab Switch (Fig. 44)

1) Remove the system control PC Board while referring to "System Control PC Board Removal".
2) Disconnect connector (3P) from safety tab switch.
3) Remove the safety tab switch fixing screw.

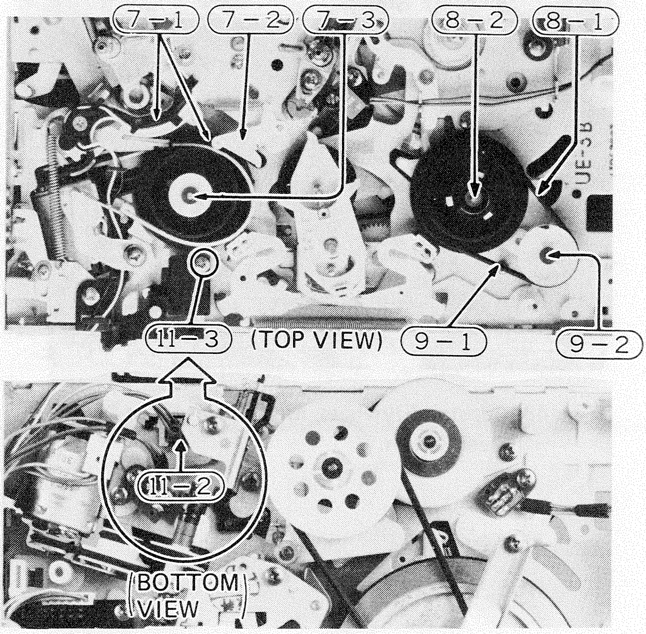


Fig. 44 Reel Tables, Load Pulley, Reel Drive Idler, Safety Tab Switch

12. End Lamp (Fig. 45)

1) Remove the cassette loading mechanism while referring to "Cassette Loading Mechanism Removal".
2) Remove the end lamp fixing screw.

13. Pressure Roller Removal (Fig. 45)

1) Remove the shield cover while referring to "Cassette Loading Mechanism Removal".
2) Remove the pressure roller fixing screw.

* Install the pressure roller with the plastic inside of the pressure roller upward.
Check the pressure roller compression strength after installation.

14. Pressure Roller Arm Bracket (Fig. 45)

1) Remove the cassette loading mechanism while referring to "Cassette Loading Mechanism Removal".
2) Remove the take-up reel disk. (See Item 8)
3) Remove the washer inserted to the pressure roller arm shaft and then remove the pressure roller arm.
4) Remove the cords from the wire tie on the bracket.
5) Remove 2 bracket fixing screws.

* Install the pressure roller arm bracket by the reverse procedure while taking care of the following.
Insert the take-up brake drive arm pin into the hold in the take-up brake operation arm.
Insert the pressure roller drive arm pin into the hole in the pressure roller operation arm.
Insert the pressure roller operation link pin into the hole in the pressure roller arm.

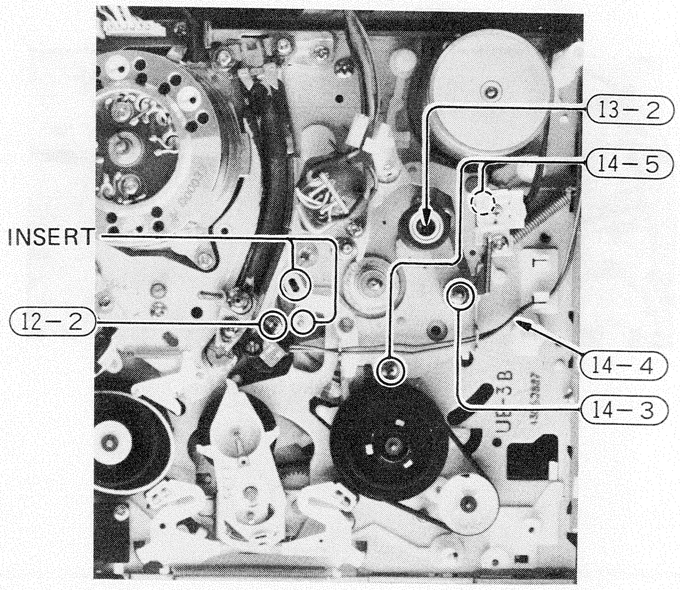


Fig. 45 End Lamp, Pressure Roller, Pressure Roller Arm Bracket

15. Clutch Plate Assembly (Fig. 46)

1) Remove the reel drive idler. (See Item 10.)
2) Remove the system control PC Board while referring to "System Control PC Board Removal".
3) Remove the reel belt.
4) Remove 2 clutch plate assembly fixing screws.

* Install the clutch plate assembly by the reverse procedure.

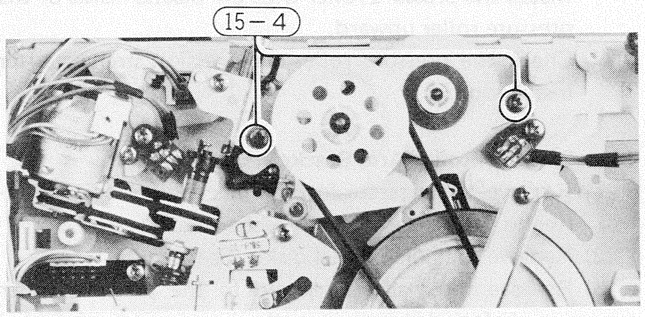


Fig. 46 Clutch Plate Assembly

16. Brake Slider (Fig. 47)

1) Remove the reel drive idler. (See Item 10.)
2) Remove the system control PC Board while referring to "System Control PC Board Removal".
3) Remove the clutch plate. (See Item 15.)
4) Remove the brake slide fixing screw.

* Insert the brake drive arm pin into the groove of the slider operation section to install the brake slider.

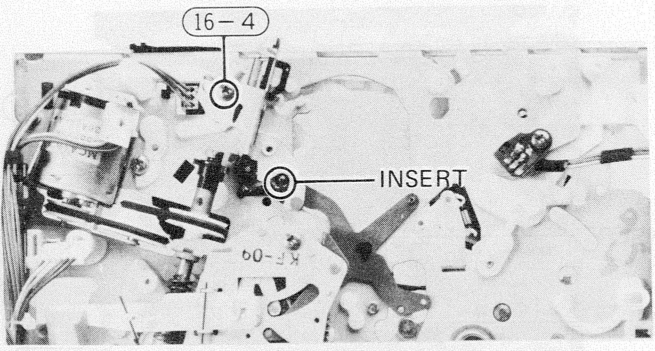


Fig. 47 Brake Slider

17. Capstan Flywheel (Fig. 48)

1) Remove the system control PC Board while referring to "System Control PC Board Removal".
2) Remove 2 flywheel bracket fixing screws to remove the flywheel support plate.
3) Remove the reel belt and flywheel belt.
4) Pull out the flywheel while taking care of the oil shield washer on the capstan shaft.

* Insert the capstan flywheel by the reverse procedure.
A washer is inserted on the flywheel of the capstan shaft.
Confirm the reference oscillation frequency adjustment after installation.
Check it before installation.

18. Mechanism State Switch (Fig. 48)

1) Remove the system control PC Board while referring to "System Control PC Board Removal".
2) Remove the mechanism state switch fixing screw and lift the screw hole side to release the fitting with the chassis.

* Fit the switch lever to the groove in the slider to screw the lever when installing the switch.
Adjust the mechanism state switch after installation.

19. Reel Sensor (Fig. 48)

1) Remove the system control PC Board while referring to "System Control PC Board Removal".
2) Remove the reel sensor PC Board fixing screw.

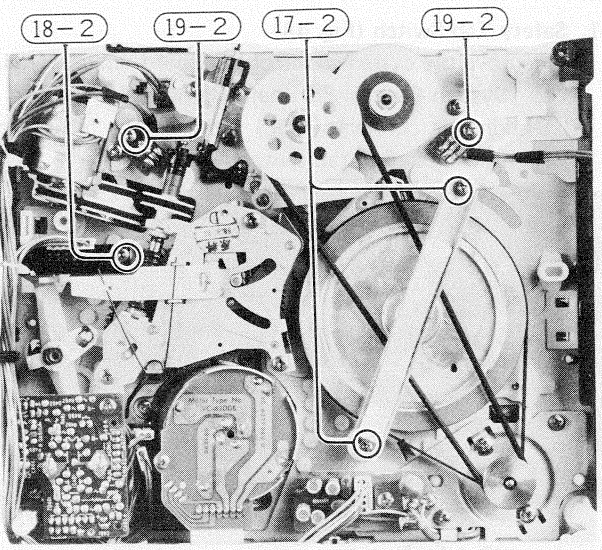


Fig. 48 Capstan Flywheel, Mechanism State Switch, Reel Sensor

20. Supply and Take-up Loading Arms (Fig. 49)

1) Remove the cassette loading mechanism while referring to "Cassette Loading Mechanism Removal".
2) Remove the tension band and tension arm. (See Item 6.)
3) Remove the sub brake. (See Item 5.)
4) Remove 3 sub chassis fixing screws and remove the sub chassis, guide pole and inclined guide together with the base.

* Install the supply and take-up loading arms by the reverse procedure fit the loading gear stopper and loading arm groove when installing the loading.

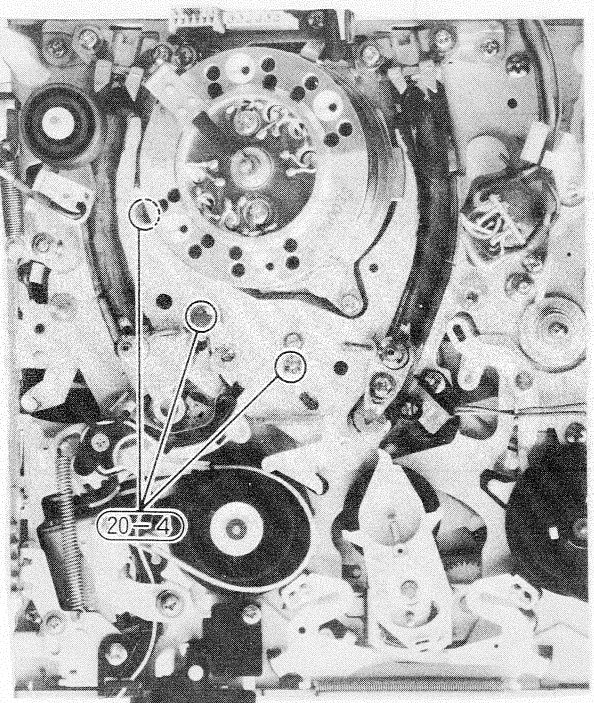


Fig. 49 Supply and Take-up Loading Arms

21. Loading Gear Assembly (Figs. 50, 51)

1) Remove the cassette loading mechanism while referring to "Cassette Loading Mechanism Removal".
2) Remove the reel drive idler. (See Item 10.)
3) Remove 2 screws on the sub chassis.
4) Remove the system control PC Board while referring to "System Control PC Board Removal".
5) Remove the capstan flywheel. (See Item 17.)
6) Remove the clutch plate. (See Item 15.)
7) Remove the brake slider. (See Item 16.)
8) Remove the mechanism state switch. (See Item 18.)
9) Remove the spring from the loading gear assembly.
10) Release the fitting with the loading gear assembly to remove the switch slider.
11) Release the fitting between the tension release arm and the chassis to remove the tension release arm.
12) Remove the loading belt.
13) Remove 3 loading gear assembly fixing screws.

* Install the loading gear assembly in the reverse procedure while paying attention to the following.

- Insert the take-up brake drive arm pin into the hole in the take-up brake operation arm.
- Insert the pressure roller drive arm pin into the hole in the pressure roller operation arm.

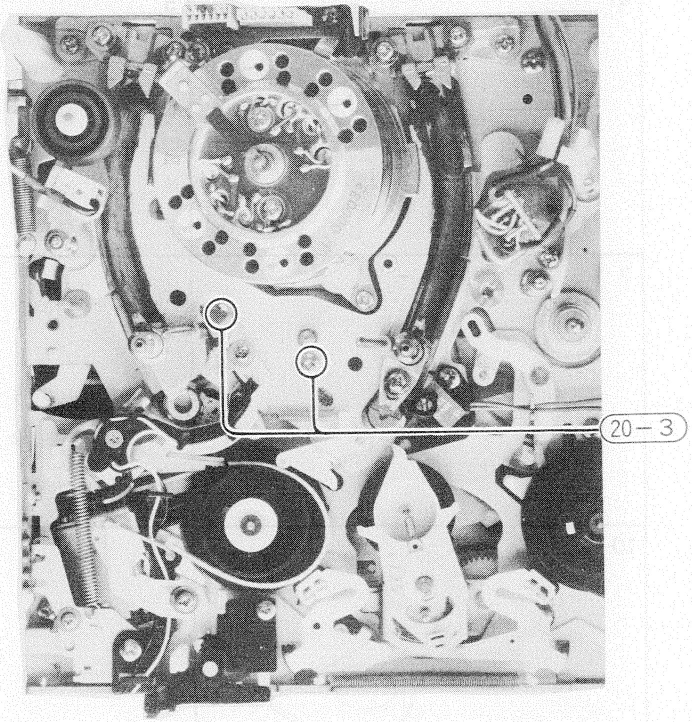


Fig. 50 Loading Gear Assembly

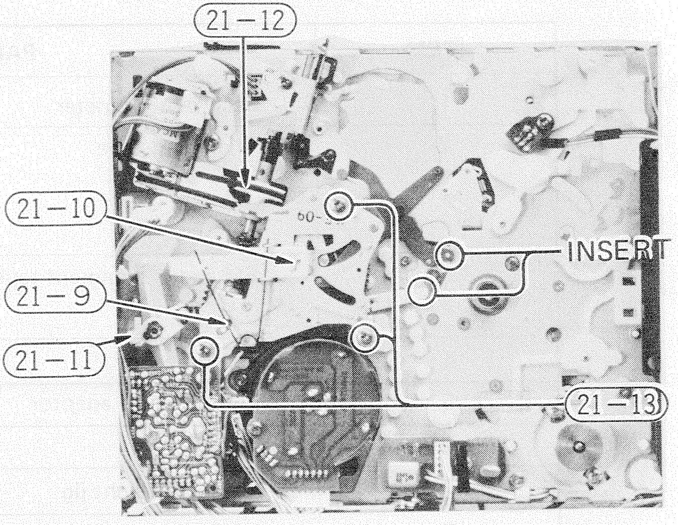
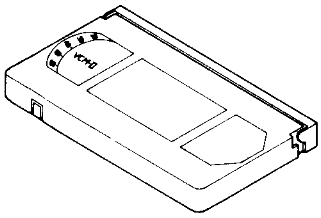


Fig. 51 Loading Gear Assembly

ADJUSTMENT

SERVICING JIGS AND TOOLS

1



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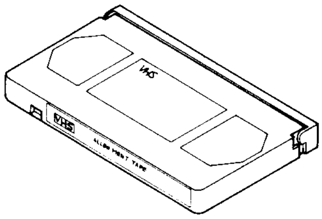

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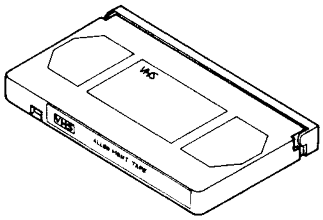

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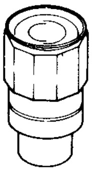

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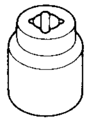

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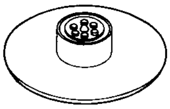

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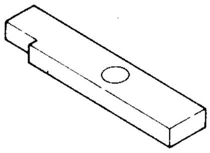

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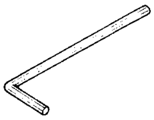

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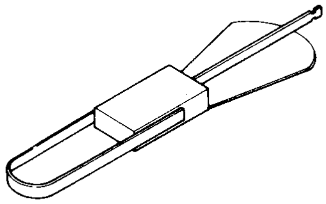

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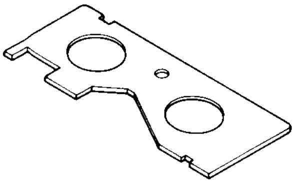


ITEM	PARTS NAME		PARTS NO.
1	Back tension meter		7099004
2	Alignment tape	(NTSC)	7099046
		(PAL)	7099052
		(SECAM)	7099053
3	FM audio alignment tape	(NTSC)	7099153
		(PAL/SECAM)	7099175
4	Torque gauge		7099039
5	Torque gauge adaptor		7099034
6	Dummy reel		7099043
7	Reel disk height jig		7099001
8	1.5 mm hexagonal wrench		―――
9	Fan type tension gauge		―――
10	Height reference plate (Master plane)		7099041

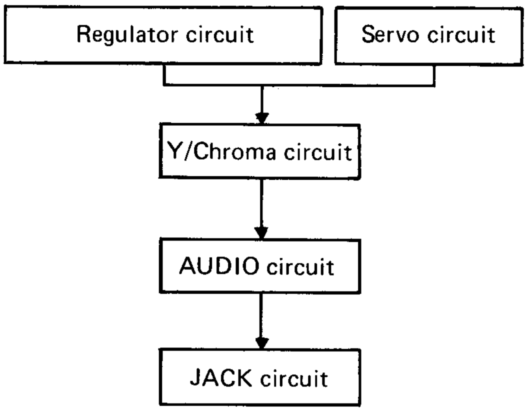
ELECTRICAL CIRCUIT ADJUSTMENT

Test equipment, jigs and tapes tequired for overall circuit adjustment

1) Color TV set
2) Oscilloscope
3) VTVM
4) Color bar signal generator
5) Frequency counter
6) DC voltmeter
7) Alignment tape
8) Blank tape

Order of adjustment

Perform adjustment in the order shown below.


Regulator circuit
Servo circuit
Y/Chroma circuit
AUDIO circuit
JACK circuit

1. REGULATOR CIRCUIT

Remove the top cover, set the VTR horizontal and follow the adjustment procedure shown below.

1. Adjustment of 9.5V output voltage: RT1151

This adjustment sets the output voltage of the 9.5V regulator precisely to 9.5V as the main power supply for the circuit.

1) Place the VTR in the "stop" mode.
2) Set the "AC" input for 220V AC. [For BS model. 240V AC]
3) Connect DC voltmeter to PG601 Pin 7 and PG601 Pin 4 (GND) on the servo/regulator circuit board.
4) Adjust RT1151 for 9.5V ± 0.1V.

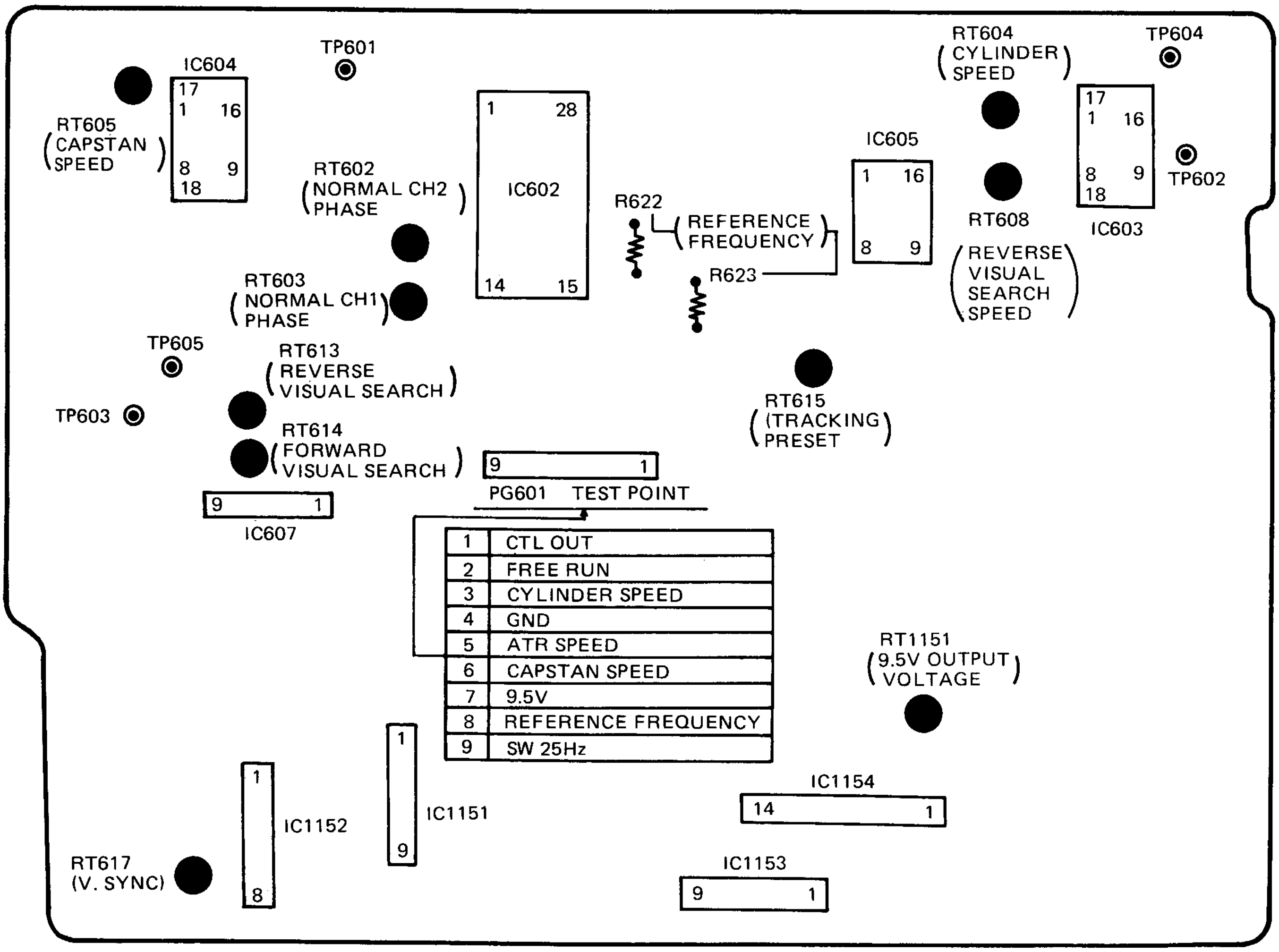

IC604
17
1 16
8 9
18
RT605
CAPSTAN SPEED
TP601
RT602
NORMAL CH2 PHASE
1 28
IC602
14 15
RT603
NORMAL CH1 PHASE
TP605
TP603
RT613
REVERSE VISUAL SEARCH
RT614
FORWARD VISUAL SEARCH
9 1
IC607
9 1
PG601 TEST POINT
1 CTL OUT
2 FREE RUN
3 CYLINDER SPEED
4 GND
5 ATR SPEED
6 CAPSTAN SPEED
7 9.5V
8 REFERENCE FREQUENCY
9 SW 25Hz
R622
REFERENCE FREQUENCY
R623
IC605
1 16
8 9
RT604
CYLINDER SPEED
TP604
17
1 16
8 9
18
IC603
TP602
RT608
REVERSE VISUAL SEARCH SPEED
RT615
(TRACKING PRESET
RT1151
9.5V OUTPUT VOLTAGE
IC1154
14 1
IC1153
9 1
1
IC1151
9
1
IC1152
8
RT617
(V. SYNC)

Fig. 1 Servo/Regulator Circuit Board (parts side)

2. SERVO CIRCUIT

1. Adjustment of cylinder speed: RT604

This adjustment locks the cylinder servo to the system signals and maintains a constant cylinder speed to a constant speed of 1500 rpm.

When this adjustment is incorrect, horizontal stability is degraded or colour and Y are displaced.

1) Supply a video signal to the video input on the rear panel or tune in a local off-air TV programme.
2) Connect the oscilloscope between the test point terminals PG601-Pin 3 and PG601-Pin 4 (GND) on the regulator/servo circuit board.
3) Load a blank tape and set the VTR/ATR switch to the VTR position.
4) Set the VTR to the record mode.
5) Short-circuit PG601 Pin 2 and PG601 Pin 7 on the regulator/servo circuit board. Adjust cylinder speed control (RT604) so that the sampling pulse superimposed on the cylinder tach pulse shown in Fig. 2 moves slowly or stands still.

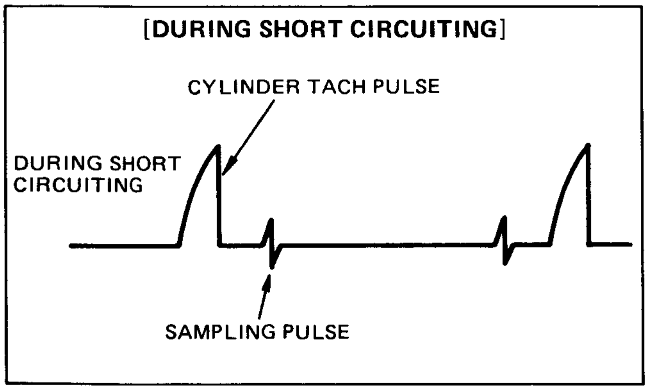

[DURING SHORT CIRCUITING]

Fig. 2 Cylinder Speed

5) Disconnect the short-circuit between PG601 Pin 2 and PG601 Pin 7. Check that the sampling pulse stands still at the trailing edge of the cylinder tach pulse shown in Fig. 3.

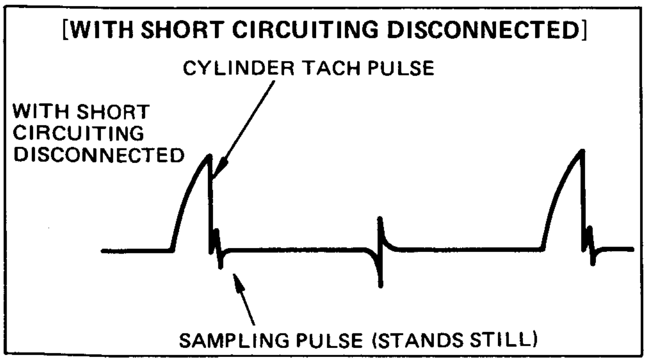

[WITH SHORT CIRCUITING DISCONNECTED]
CYLINDER TACH PULSE
WITH SHORT CIRCUITING DISCONNECTED
SAMPLING PULSE (STANDS STILL)

Fig. 3 Cylinder Speed

2. Adjustment of capstan speed: RT605

This adjustment locks the capstan servo to the system signals and maintains a constant tape transport speed.

VTR: 23.39mm/sec.
ATR: 11.7mm/sec.

When this adjustment cannot be done properly, the vertical stability of the picture is degraded or the picture has much noise.

1) Supply a video signal to the video input on the rear panel or tune to a local off-air TV programme.
2) Connect the oscilloscope between the test point terminals PG601 Pin 6 and PG601 Pin 4 (GND) on the regulator/servo circuit board.
3) Load a blank tape and set the VTR/ATR switch to the VTR position.
4) Set the VTR to the record mode.
5) Short-circuit PG601 Pin 2 and PG601 Pin 7 on the regulator/servo circuit board. Adjust capstan speed control (RT605) so that the sampling pulse superimposed on the tracking MM charge curve moves slowly or stands still shown in Fig. 4.

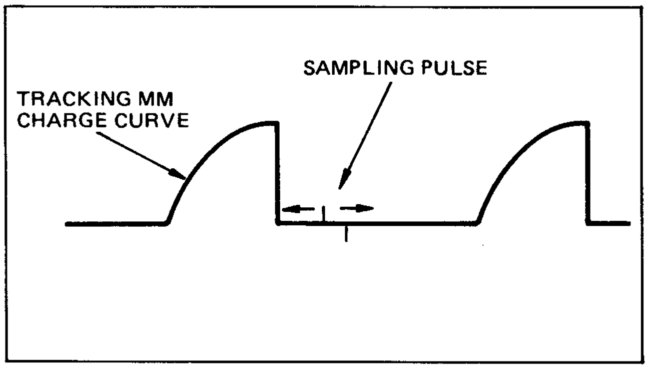


Fig. 4 Capstan Speed

5) Disconnect the short-circuit between PG601 Pin 2 and PG601 Pin 7. Check that the sampling pulse stands still around the leading edge of the tracking MM charge curve shown in Fig. 5.

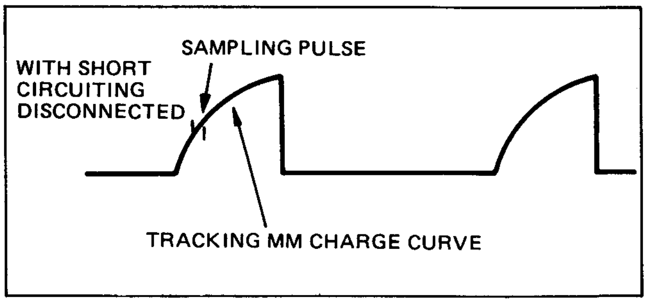


Fig. 5 Capstan Speed

Reference

The tape speed in the VTR mode is not required to by adjusted. When confirming the speed, set the VTR/ATR switch to the VTR position and short-circuit between test point terminals PG601 Pin 2 and PG601 Pin 7 while recording. Confirm that the sampling pulse shown in Fig. 4 stands still at that time.

3. Adjustment of reference frequency: R622, R623

This adjustment corrects the servo control loss especially caused by unevenness of the belt and pulley in the operation transmission system between the capstan motor and capstan shaft.

This adjustment fine-adjusts the reference signal frequency.

1) Connect a frequency counter to the audio output jack on the front panel.
2) Short-circuit PG601 Pin 8 and PG601 Pin 7 on the regulator/servo circuit board. Then, load the VTR with test tape and playback audio 3 kHz signal.
3) Confirm that the reading of the frequency counter is 3,000Hz ± 15Hz. Omit R622 when the reading is more than 3015 Hz. On the contrary, omit R623 when it is less than 2985 Hz.

Note: Both resistors or either one may be present. It may be necessary to reinstall a missing resistor if the correct reading cannot be obtained.

4. Adjustment of normal video head switching point: RT603 (CH1), RT602 (CH2)

The tach pulse MM determines the video head switching point during playback. Misadjustment may cause head switching noise in the picture and/or vertical jitter.

1) Playback the alignment tape.
2) Connect channel-1 of the oscilloscope to PG601 Pin 9 (Head switching pulse output) on the regulator/servo circuit board.
3) Connect channel-2 of the oscilloscope to video output jack on the rear panel.
4) Set the synchronization to "-slope" and adjust RT603 (CH1 PHASE) so that the head switching point occurs 6.5H ± 0.5H horizontal lines after the start of vertical sync shown in Fig. 6.

Note: If head switching occurs too soon, a small noise band may appear at the bottom of the picture.
If the head switching pulse is late, noise can be introduced during vertical sync, resulting in possible vertical sync problems.

5) Set the synchronization to "+ slope" and adjust RT602 (CH2 PHASE) so that other head-switching point occurs 6.5Hz ± 0.5H horizontal lines after the start of vertical sync shown in Fig. 6.

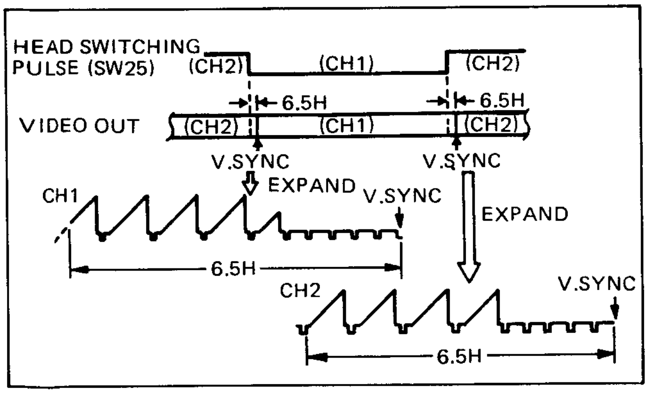


Fig. 6 Normal Head Switching point

5. Adjustment of tracking preset: RT615

Tracking during playback of the tape recorded on this VTR is done by these adjustments. When these adjustments are incorrect, it results in a noisy picture with the tracking control set to the center click position or noise may not be removed completely with the tracking control turned.

(Rough adjustment)

1) Supply a video signal to the video input on the front panel or tune in a local off-air TV programme.
2) Connect the oscilloscope to TP202 (Playback FM-Video output) on the Y/chroma circuit board.
3) Load the VTR with a blank tape and place in the record mode. Then playback this section for adjustment.
4) Set the tracking control RV901 on the front panel to the click position and adjust RT615 (TRACKING PRESET) so that the output of the FM envelope is at max. Next turn the tracking control left and right centering on the click point to check that RT615 is adjusted to the max. output point.

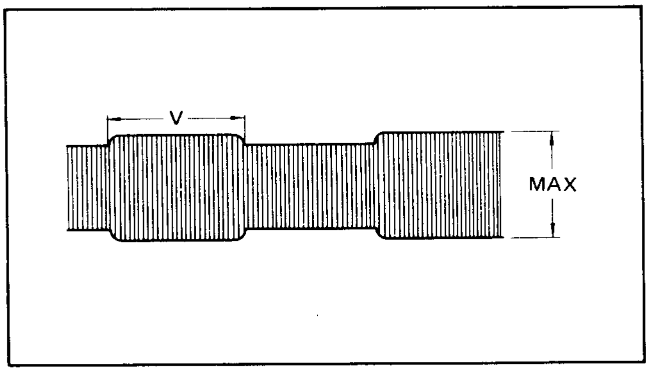


Fig. 7 Rough Tracking Preset

(Fine adjustment)

1) Connect channel-1 terminal of the oscilloscope to PG601 Pin 9 (SW25Hz).
2) Connect channel-2 terminal of the oscilloscope to PG601 Pin 1 (CTL pulse)
3) Set the tracking control (RV901) to its center click position.
4) Adjust RT615 so that the CTL pulse is set to 500μsec ± 200μsec before leading edge of the SW25Hz signal.

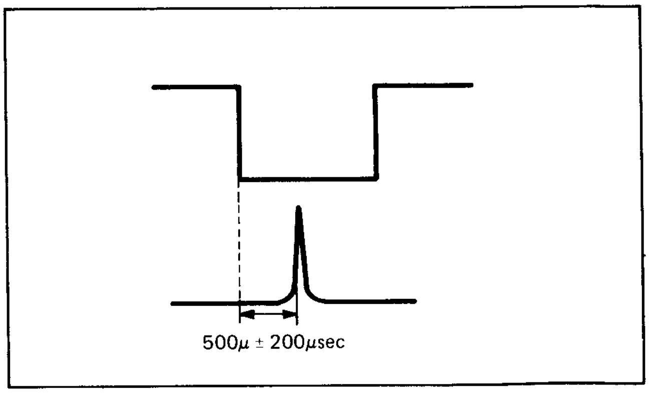


Fig. 8 Fine Tracking Preset

6. Adjustment of visual search speed

This adjustment stabilizes the noise bands in the visual search speed picture..

1) Connect the monitor TV to the VHF output jack.
2) Short-circuit test point terminals PG601 Pin 2 and Pin 7.
3) Playback the alignment tape.

Reverse visual search: RT613

4) Set the VTR to the reverse visual search mode, and connect a oscilloscope to PG601 Pin 1.
5) Adjust RT613 so that the period of the CTL pulse is approx. 10msec.

Reverse visual search speed: RT608

6) Connect the frequency counter to TP602.
7) Adjust RT608 so that the reading of the frequency counter is 1,467 Hz ± 3Hz.
8) Adjust RT613 while observing the monitor TV screen so that the noise bars on the screen are stabilized.

Forward visual search. RT614

9) Playback the recorded section in the forward visual search mode.
10) Adjust RT614 while observing the monitor TV screen so that the noise bars on the screen are stabilized.
11) Release short-circuit between test point terminals PG601 Pin 2 and PG601 Pin 7, and confirm that the noise bars are stabilized in both the reverse and forward search modes.

7. Adjustment of additional V sync signal: RT617

1) Receive a TV programme or connect the colour bar signal generator to the video input jack.
2) Connect the monitor TV to the VHF output jack.
3) Playback the recorded section in the still mode.
4) Press the remote control F. ADV button while observing the monitor TV screen to remove the noise bar from the screen.
5) Adjust RT617 so that vertical jitter of the picture is minimized.

3. Y/CHROMA CIRCUIT

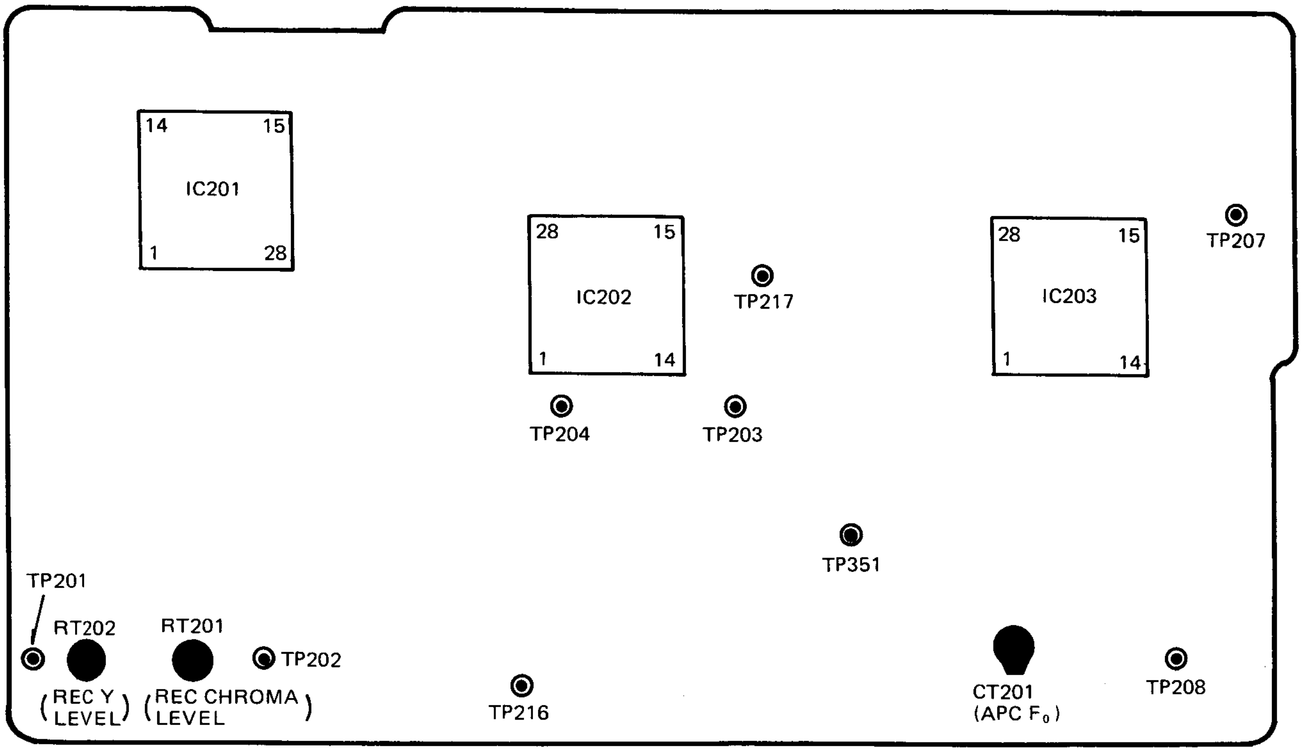


Fig. 9 Y/Chroma Circuit Board (solder side)

1. Adjustment of APC Fo (4.44 MHz): CT201

Perform this adjustment to set so that the colour subcarrier wave 4.43 MHz can be oscillated precisely.

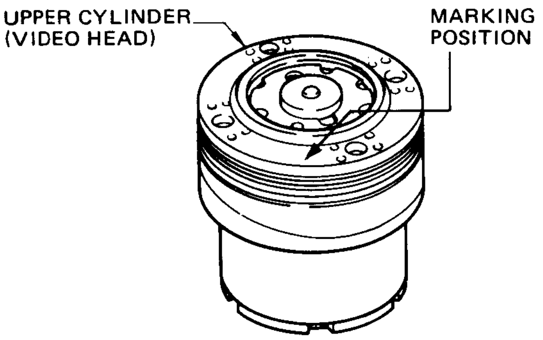
1) Connect the frequency counter to TP208.
2) Place the VTR in the "F. FWD" mode.
3) Adjust CT201 so that the frequency measured by the counter is 4.435572MHz ± 20Hz.

2. Adjustment of record chroma level: RT201

Optimum chroma level when recording is regulated by this adjustment.

When adjustment is not complete and the level is too high, diamond beats can be seen in the screen; on the other hand, when the level is too low, the colour S/N ratio deteriorates, that is, colour is degraded.

1) Supply a video signal (colour-bars) to the video input on the rear panel.
2) Connect the oscilloscope to the test point terminal TP201 (record current test point).
3) Load the VTR with a blank tape and place in the SP record mode.
4) Turn RT202 (REC Y LEVEL) fully counterclockwise.
5) Check the upper cylinder for a mark located on the top shown in Fig. 10.
6) Adjust the RT201 (REC CHROMA LEVEL) to set the cyan portion according to the table in Fig. 10 as shown in Fig. 11.



Record chroma level table

Cylinder mark	Level
No mark	35 mVp-p
1	40 mVp-p
2	45 mVp-p
3, 4	50 mVp-p

Fig. 10 Cylinder marking

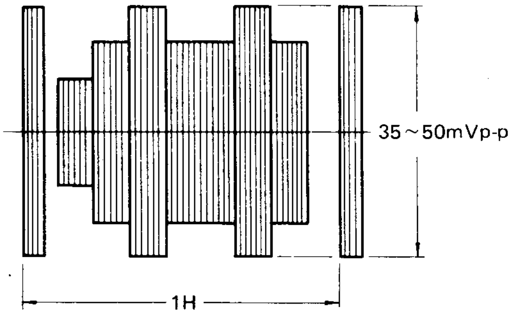


Fig. 11 Record Chroma Level

3. Adjustment of record Y level: RT202

Optimum record Y level is regulated by this adjustment. When adjustment is not complete and the level is too high, B/W may invert or the S/N ratio may deteriorate, that is, the picture may become rough. On the other hand, when the level is too low, the S/N ratio deteriorates.

1) Supply a video signal (colour-bars) to the video input on the front panel.
2) Connect the oscilloscope to the test point terminal TP201.
3) Load the VTR with a blank tape and place in the SP record mode.
4) Adjust RT202 (REC Y LEVEL) so that the sync position of the envelope is 115 mVp-p ± 5 mVp-p shown in Fig. 12.

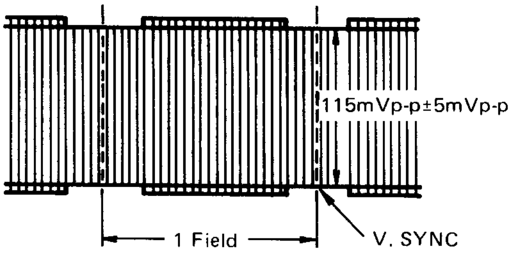


Fig. 12 Record Y Level

4. AUDIO CIRCUIT

Remove the top cover, set the VTR horizontal and follow the adjustment procedure shown below.

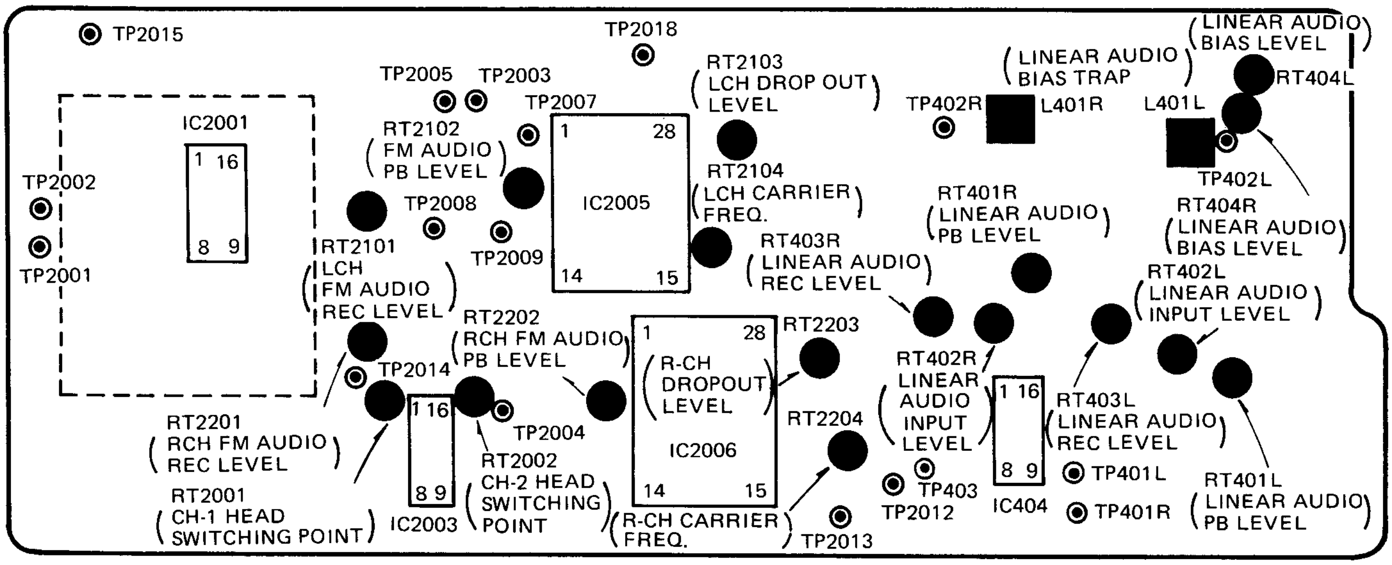

TP2015
TP2018
TP2005
TP2003
TP2007
RT2103 (LCH DROP OUT LEVEL)
(LINEAR AUDIO BIAS TRAP)
(LINEAR AUDIO BIAS LEVEL)
RT404L
TP402R
L401R
L401L
IC2001
1 16
8 9
TP2002
TP2001
RT2102 (FM AUDIO PB LEVEL)
1 28
IC2005
14 15
RT2104 (LCH CARRIER FREQ.)
TP402L
RT401R (LINEAR AUDIO PB LEVEL)
RT404R (LINEAR AUDIO BIAS LEVEL)
TP2008
TP2009
RT2101 (LCH FM AUDIO REC LEVEL)
RT403R (LINEAR AUDIO REC LEVEL)
RT402L (LINEAR AUDIO INPUT LEVEL)
RT2202 (RCH FM AUDIO PB LEVEL)
RT2203
TP2014
R-CH DROPOUT LEVEL
1 28
IC2006
14 15
RT402R (LINEAR AUDIO INPUT LEVEL)
1 16
8 9
RT403L (LINEAR AUDIO REC LEVEL)
RT2201 (RCH FM AUDIO REC LEVEL)
1 16
8 9
TP2004
RT2002 (CH-2 HEAD SWITCHING POINT)
RT2204
TP403
TP401L
RT401L (LINEAR AUDIO PB LEVEL)
RT2001 (CH-1 HEAD SWITCHING POINT)
IC2003
R-CH CARRIER FREQ.
TP2013
TP2012
IC404
TP401R

Fig. 13 Audio Circuit Board (parts side)

1. Adjustment of head switching point: RT2001, RT2002 (Shown in Fig. 14)

This adjustment sets the FM audio head switching position to the center where the CH-1/CH-2 envelopes overlap during playback. When this adjustment is incomplete, noise may occur or sound may be muted because the part of envelope is missed.

1) Connect the CH-2 probe of the oscilloscope to TP2015 (SW 25Hz) to apply synchronization with the SW 25Hz signal.
2) Connect the CH-1 probe of the oscilloscope to TP2014 (SW 25Hz-A).
3) Load the VTR with the FM audio alignment tape and place the unit in the play mode.
4) Adjust RT2001 so that time difference "T1" between SW 25Hz signal and SW 25Hz-A signal is 13.24 ± 0.05 msec.
5) Adjust RT2002 so that the time difference "T2" is 33.24 ± 0.05 msec.
6) Release the CH-1 probe from TP2014 and connect it to TP2005 to check the L-CH Audio FM output.
   If there is a missing in the FM signal, readjust both RT2001 and RT2002.

2. Adjustment of FM audio playback level

This adjustment sets the output level of the FM audio signal to the specified level.

1) Connect the VTVM (or oscilloscope) to TP2009 for L-CH and to TP2010 for R-CH.
2) Play back the FM audio alignment tape.

L-CH FM audio playback level: RT2102

3) Turn RT2103 (L-CH DROP OUT LEVEL) fully clockwise.
4) Adjust RT2102 for 346 mVrms (979 mVp-p on oscilloscope).

R-CH FM audio playback level: RT2202

5) Turn RT2203 (R-CH DROP OUT LEVEL) fully clockwise.
6) Adjust RT2202 for 346 mVrms (979 mVp-p on oscilloscope).

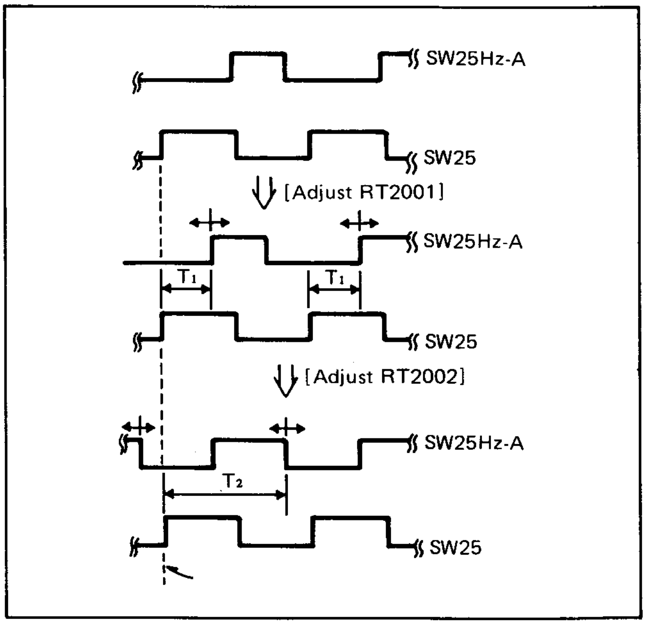

SW25Hz-A
SW25
[Adjust RT2001]
SW25Hz-A
T1
T1
SW25
[Adjust RT2002]
SW25Hz-A
T2
SW25

Fig. 14 Head Switching Point

3. Adjustment of dropout level: RT2103, RT2203

This adjustment optimizes the drop out detection level of the FM audio signal.

When this adjustment is incomplete and the level is too high, the drop out detector responds the minute drop out of the envelope, noise may occur, the Hi-Fi audio may be muted and changed to the linear audio. On the other hand, when the level is too low, the drop out cannot be compensated, the Hi-Fi audio may not be muted when the tracking control is turned, or it may not be changed to the linear audio when the envelope is missed.

1) Connect the VTVM to TP2007 for L-CH and to TP 2008 for R-CH.
2) Play back the FM audio alignment tape.
3) Adjust RT2103 and RT2203 for 1.4 ± 0.05V respectively for left and right channels.

4. Adjustment of carrier frequency and FM audio record level

These adjustments optimize the modulation frequency and record level of the audio signal.

When the carrier frequency adjustment is incomplete and the modulation frequency drifts from the specified value, the frequency deviation becomes narrower and sound may be distorted at the large input.

When the FM audio record level adjustment is incomplete and the level is too high, the video S/N is degraded, and when the level is too low, the audio (FM) S/N is degraded.

1) Connect the CH-1 terminal of the oscilloscope and the frequency counter to TP2001. (GND: TP2002)
2) Load the VTR with a blank tape and place the unit in the record mode.
3) Turn off the ALC switch (S1227) on the front panel (timer circuit board) and turn RT1201 and RT1202 (Record Level) for minimum settings.

L-CH carrier frequency (RT2104) and FM audio record level (RT2101)

4) Short-circuit TP2013 (9.5V) and TP2004 to stop recording of the R-ch signal.
5) Turn RT2101 fully clockwise (maximum record current).
6) Adjust RT2104 so that the reading of the frequency counter is 1403kHz ± 2kHz.
7) Adjust RT2101 for 55mVp-p.

R-CH carrier frequency (RT2204) and FM audio record level (RT2201)

8) Short-circuit TP2013 (9.5V) and TP2003 to stop recording of the L-ch signal.
9) Turn RT2201 fully clockwise (maximum record current).
10) Adjust RT2204 so that the reading of the frequency counter is 1803kHz ± 2kHz.
11) Switch over the vertical gain range of the CH-1 terminal of the oscilloscope to 20mV/div.
12) Adjust RT2201 for 135mVp-p.

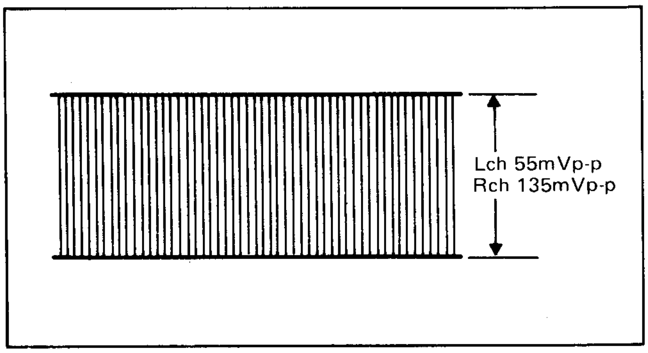


Fig. 15 FM Audio Record Level

5. Adjustment of linear audio input level: RT402L, RT402R

Optimum input level is regulated by this adjustment. When adjustment is not complete and level is too high, distortion is likely to occur; on the other hand, when level is too low, hissing noise becomes conspicuous, and also the noise reduction effect is degraded.

1) Set the VTR to E-E mode.

R-CH audio input level: RT402R

2) Connect audio signal generator (400 Hz: –8 dB) to the R-CH audio input jack and apply audio signal.
3) Connect the VTVM to the R-CH TP401R.
4) Adjust RT402R (R-CH INPUT LEVEL) so that the reading of the VTVM is –8 ± 0.5 dB (316 ± 20 mV).

L-CH audio input level: RT402L

5) Connect the VTVM to the L-CH TP401L.
6) Adjust RT402L (L-CH INPUT LEVEL) so that the reading of the VTVM is –8 ± 0.5 dB (316 ± 20 mV).

6. Adjustment of linear audio playback level: RT401R, RT401L

The playback level is regulated by this adjustment. When adjustment is not complete and level is too low, the playback level drops and when the level is too high, the playback level becomes higher.

Linear audio R-CH playback level. RT401R

1) Connect the VTVM to the R-CH audio output jack on the rear panel.
2) Playback the 1 kHz audio track section of the alignment tape.
3) Adjust RT401R (R-CH PLAYBACK LEVEL) so that the reading of the VTVM is –5 ± 1 dB.

Linear audio L-CH playback level: RT401L

4) Connect the VTVM to the L-CH audio output jack on the rear panel.
5) Adjust RT401L (L-CH PLAYBACK LEVEL) so that the reading of the VTVM is –5 ± 1 dB.

7. Adjustment of linear audio bias level: RT404R, RT404L

Optimum audio record bias is regulated by this adjustment. When adjustment is not complete and the level is too low, high frequencies are boosted and distortion increases. On the contrary, when the level is too high, frequency response deteriorates, that is, high frequency are degraded.

R-CH bias level: RT404R

1) Short-circuit the audio input jacks and ground.
2) Load the VTR with a blank tape and place in "SP Record" mode.
3) Connect the VTVM to R-CH of the audio/control head.
4) Adjust RT404R (R-CH BIAS LEVEL) so that the reading of the VTVM is 340 μA.

L-CH bias level: RT404L

5) Connect the VTVM to L-CH of the audio/control head.
6) Adjust RT404L (L-CH BIAS LEVEL) so that the reading of the VTVM is 340 μA.

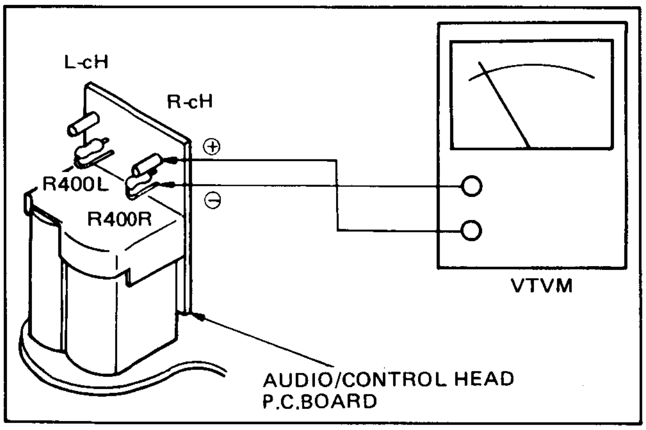


Fig. 16 Audio Control Head

8. Adjustment of linear audio record level: RT403R, RT403L

Optimum record level is regulated by this adjustment. When adjustment is not complete and the level is too high, distortion is likely to occur; on the other hand, when the level is too low, hissing noise becomes conspicuous, and also the noise reduction effect is degraded.

R-CH record level: RT403R

1) Connect VTVM to TP402R and connect audio signal generator (400 Hz, –8 dB) to the R-CH audio input jack.
2) Adjust RT403R (R-CH RECORD LEVEL) so that the reading of the meter is –29 dB ± 0.5 dB.
3) Disconnect the VTVM and connect it to the R-CH audio output jack.
4) Load the VTR with a blank tape and place it in the record mode for few minutes.
5) Playback the recorded section and confirm the reading of the meter to –8 dB ± 0.5 dB.
6) If it is not, readjust RT402R with calibrating the audio record level at TP402R as shown below.
   example: The reading at the output jack is –10 dB. Then the reading at TP402R is –27 dB (= –29 – (–2)).

L-CH record level: RT403L

7) Connect the testmeter to TP402L and connect audio signal generator (400 Hz, –8 dB) to the L-CH audio input jack.
8) Adjust RT403L (L-CH RECORD LEVEL) so that the reading of the meter is –29 dB ± 0.5 dB.
9) Disconnect the VTVM and connect it to the L-CH audio output jack.
10) Load the VTR with a blank tape and place it in the record mode for few minutes.
11) Playback the recorded section and confirm the reading of the meter to –3 dB ± 0.5 dB.
12) If it is not, readjust RT402L with calibrating the audio input level as shown below.
    example. Then reading on TP405R is –10 dB. Then the input at the reading at TP402L is –27 dB (= –29 – (–2)).

9. Adjustment of linear audio bias trap. L401L, L401R

1) Place the VTR in the record mode without audio input signals.

R-CH bias trap: L401R

2) Connect the VTVM to TP402R.
3) Adjust L401R to be minimum reading.

L-CH bias trap: L401L

4) Connect the VTVM to TP402L.
5) Adjust L401L to be minimum reading.

5. JACK CIRCUIT

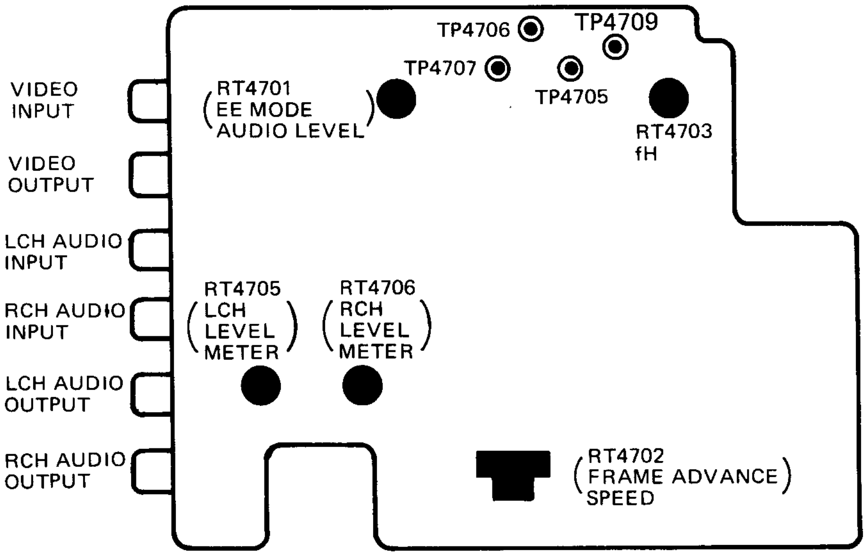

TP4706
TP4709
TP4707
TP4705
VIDEO INPUT
VIDEO OUTPUT
LCH AUDIO INPUT
RCH AUDIO INPUT
LCH AUDIO OUTPUT
RCH AUDIO OUTPUT
RT4701 (EE MODE AUDIO LEVEL)
RT4703 fH
RT4705 (LCH LEVEL METER)
RT4706 (RCH LEVEL METER)
RT4702 (FRAME ADVANCE SPEED)

Fig. 17 Jack Circuit Board (parts side)

1. Adjustment of EE mode audio level: RT4701

Perform this adjustment so that the EE mode and THROUGH mode levels match.

1) Connect the VTR to a TV set.
2) Connect the VTVM to the audio output of the TV set.
3) Receive a TV programme.
4) Adjust RT4701 so that between the THROUGH mode and EE modes is within ±1 dB based on the THROUGH mode level.

2. Adjustment of f_H: RT4703

1) Connect the frequency counter to TP1706.
2) Connect an electrolytic capacitor (47 μF/16V) between TP4709 and TP4707.
3) Adjust RT4703 for 15.625 ± 0.1 kHz.

3. Adjustment of frame advance speed: RT4702

This adjustment sets the frame feed speed in the frame advance mode.

1) Supply a video signal to the video input on the rear panel or tune to a TV programme.
2) Connect the RF output to the TV antenna terminal.
3) Load the VTR with a blank tape and set the VTR/ATR switch to the VTR position. (Record for enough time to adjust during playback in the frame advance mode.)
4) Set the VTR to the record mode.
5) Playback the recorded signal in the pause mode and hold the frame advance button in the depressed position.
6) Adjust RT4702 on the jack circuit board so that the 8 to 12 frames are fed for 10 seconds when holding the frame advance button in the depressed position.

4. Adjustment of level meter: RT1705, RT1706

1) Connect the VTVM to the Audio output jack.
2) Set the REC volume so that the reading of the VTVM is −8 dB.
3) Adjust both RT4705 & RT4706 so that the 0 dB point of the level meter light on.

6. MULTIPLEX DEMODULATOR CIRCUIT
[For E model]

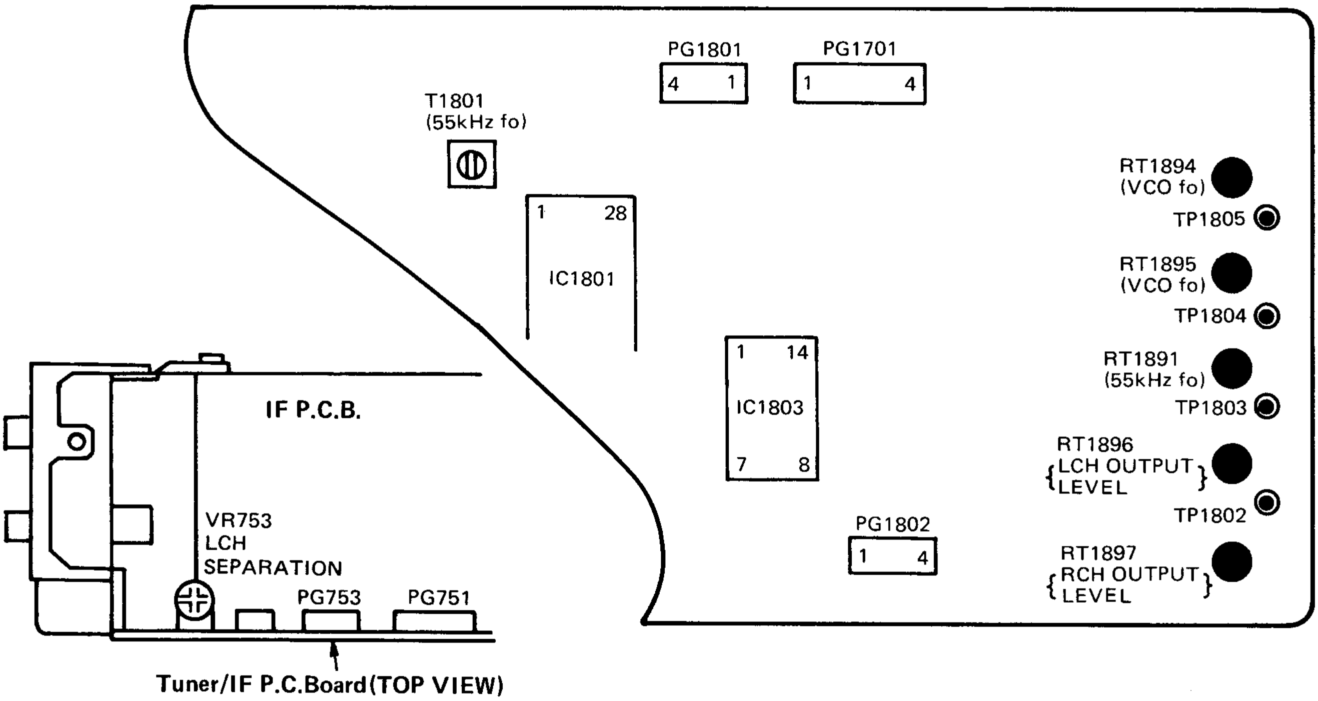

PG1801
4 1
PG1701
1 4
T1801
(55kHz fo)
1 28
IC1801
1 14
IC1803
7 8
RT1894
(VCO fo)
TP1805
RT1895
(VCO fo)
TP1804
RT1891
(55kHz fo)
TP1803
RT1896
LCH OUTPUT LEVEL
TP1802
RT1897
RCH OUTPUT LEVEL
PG1802
1 4
IF P.C.B.
VR753
LCH
SEPARATION
PG753
PG751
Tuner/IF P.C.Board(TOP VIEW)

Fig. 18 Multiplex Demodulator Circuit Board (parts side)

Note: 1. Set all the semi-variable resistors on the demodulator board to around the center of their variable ranges.
2. Set the audio channel select switch to "CH1 + CH2"

1. Adjustment of 55 kHz fo: RT1891, T1801

1) Connect the oscilloscope to the test point terminal TP1803.
2) Receive a stereo broadcast.
3) Adjust RT1891 so that the waveform is 0.1 Vp-p.
4) Adjust T1801 so that the waveform is maximized.

2. Adjustment of VCO fo: RT1895 (RT1894)

1) Connect the counter to the test point terminal TP-1804 (TP1805).
2) Receive a monaural broadcast.
3) Adjust RT1895 (RT1894) so that the frequency of the wave is 235 ± 2 Hz (548 ± 2 Hz).

3. Adjustment of L-CH separation: VR753

1) Connect the oscilloscope to the Audio output jack (L ch) on the rear panel.
2) Receive a stereo broadcast.
3) Cut off the modulation of L-channel.
4) Adjust VR753 so that the R-CH signal is minimized.

4. Adjustments of L-CH/R-CH output level: RT1896(L-CH), RT1897(R-CH)

1) Connect the VTVM to the Audio output jack (L-ch (R-ch)) on the rear panel.
2) Receive a monaural broadcast.
3) Adjust RT1896 (L-CH) and RT1897 (R-CH) so that they are both −15 ± 0.5 dBm.

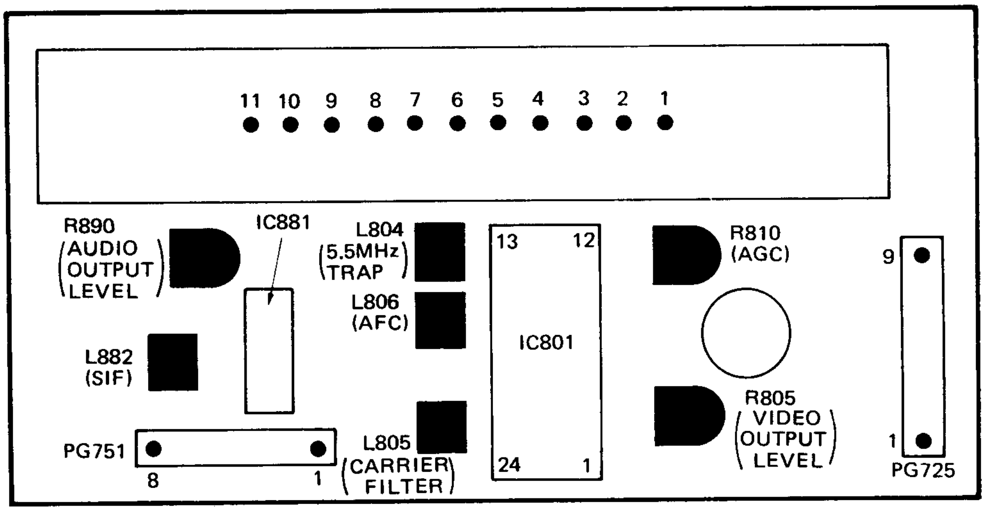
5. Adjustment of pilot signal level: RT1891

1) Connect the VTVM to the test point terminals TP-1803 and TP1802 (GND).
2) Receive a stereo broadcast.
3) Adjust RT1891 (PILOT SIGNAL LEVEL) so that the reading of the VTVM is −18 ± 1 dBm.

7. TUNER/IF CIRCUIT [For UK model]

Note:

- In the unit, the tuner pack and IF is a single unit. It has been adjusted carefully, but if it gets out of adjustment, adjust it by the following procedure.
- Generator: 75Ω OPEN

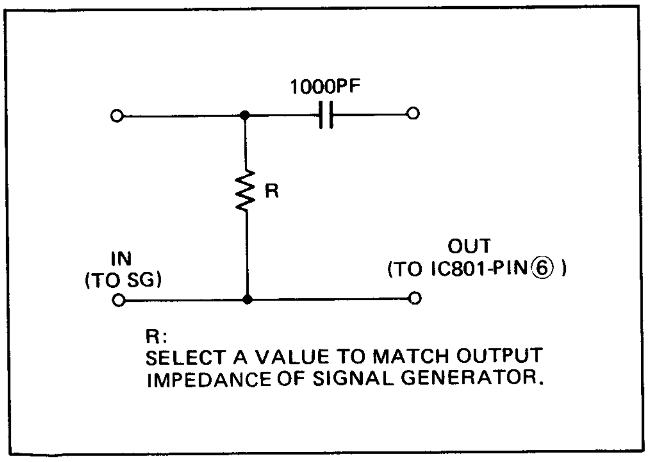


11 10 9 8 7 6 5 4 3 2 1
R890 (AUDIO OUTPUT LEVEL)
IC881
L804 (5.5MHz TRAP)
L806 (AFC)
13
12
IC801
24
1
R810 (AGC)
9
L882 (SIF)
R805 (VIDEO OUTPUT LEVEL)
PG751
8
1
L805 (CARRIER FILTER)
1
PG725

Fig. 20 IF Circuit Board (parts side)

1. Adjustment of carrier filter: L805

1) Connect the sweep marker generator to IC801 pin 6 of the IF pack via the coupling circuit shown in Fig. 21.
   [SG] Output: -30 ± 10 dBm (5.62 mV – 56.2 mV)
   Frequency: 39.5 MHz
2) Set the unit to the EE mode.
3) Supply +8.9V DC to IC801 Pin 12, +12V DC to PG751 Pin 5.
4) Connect the oscilloscope to PG751-Pin 2 and observe the IF signal waveform.
5) Adjust the core of L805 so that the 39.5 MHz ± 50 kHz component of the waveform of video output is maximum. (See Fig. 22)



1000PF
R
IN (TO SG)
OUT (TO IC801-PIN⑥)
R:
SELECT A VALUE TO MATCH OUTPUT IMPEDANCE OF SIGNAL GENERATOR.

Fig. 21 Coupling Circuit

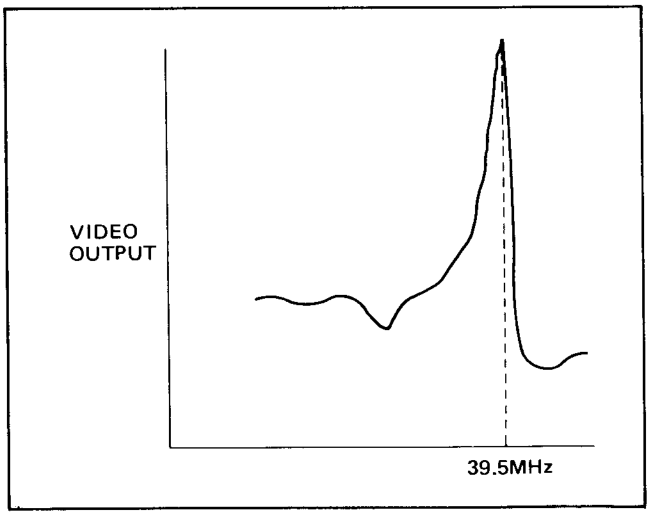


Fig. 22 Waveform of Video Output

2. Adjustment of audio trap: L804

1) Connect the sweep marker generator to IC801 Pin 6 of the IF pack via the coupling circuit shown in Fig. 21.
   [SG] Output: -20 ± 10 dBm (17.8 mV – 177.8 mV)
   Frequency: 33.5 MHz
2) Set the unit to the EE mode.
3) Connect the oscilloscope to PG751-Pin 2, +12V DC to PG751 Pin 5.
4) Supply +8.9V DC to IC801 Pin 12.
5) Adjust the core of L804 so that the level of audio trap frequency (33.5 MHz) is minimum. (See Fig. 23)

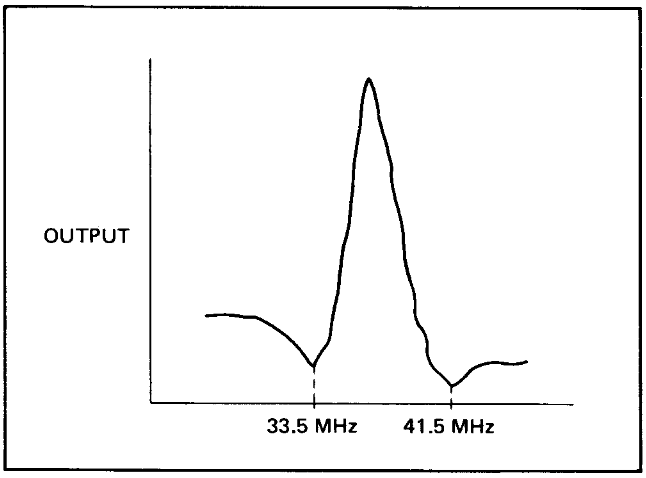


Fig. 23 Audio Trap

3. Adjustment of AFC: L806

1) Connect the sweep marker generator to tuner pack-Pin 9 via the coupling circuit shown in Fig. 24.
   [SG] Output: -4 ± 5 dBm (199.5 mV – 631 mV)
   Frequency: 33.5 MHz
2) Set the unit to the EE mode.
3) Supply +9.1V DC to IC801 Pin 12 + 12V DC to PG751 Pin 5.
4) Connect the oscilloscope to PG752 Pin 17 via the coupling circuit shown in Fig. 24.
5) Adjust L806 so that the output voltage at 39.5 MHz is 6.5V ± 1.0V. (See Fig. 24)

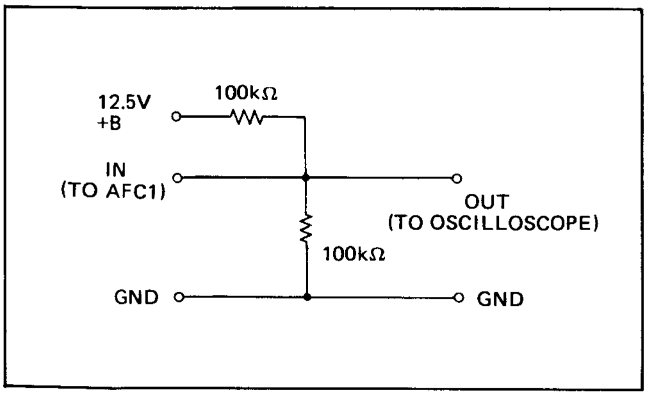


Fig. 24 Coupling Circuit

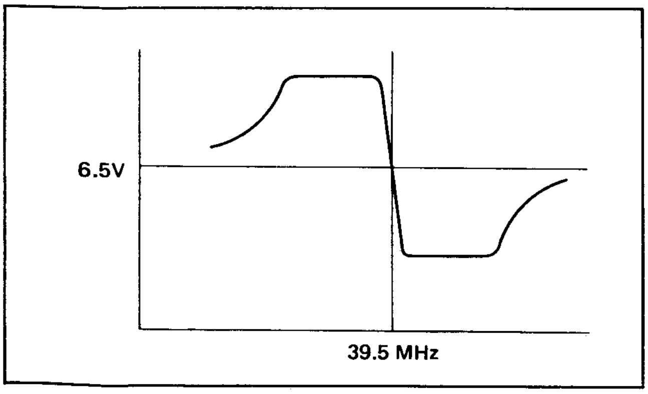


Fig. 25 AFC

4. Adjustment of SIF: L882

1) Connect the AM signal generator to IC801 Pin 2 of IF pack via the coupling circuit shown in Fig. 19.
   [AMSG] Output: –60 ± 5 dBm (316 mV – 1000μV)
   Frequency: 33.5 ± 5 kHz
   MOD. signal: 400 Hz
   Modulation: AM 30%
2) Set the unit to the EE mode.
3) Connect the oscilloscope to PG751-Pin 4 and observe the audio IF signal waveform.
4) Supply +8.9V DC to IC801 Pin12 + 12V DC to PG751 Pin5.
5) Adjust L882 so that the output is minimum.

5. Adjustment of video output: R805

1) Connect the colour bar generator to the aerial input terminal of VTR.
   [Generator] Output: -41 ± 10 dBm (1.58 mV)
   Modulation degree: 87.5%
2) Connect the oscilloscope to PG751 Pin 2.
3) Set the unit to the EE mode.
4) Tune the VTR for best reception by observing the picture on the screen.
5) Close the channel preset cover. (AFC switch: ON).
6) Adjust P805 so that the output level is 1 Vp-p. (See Fig. 26)

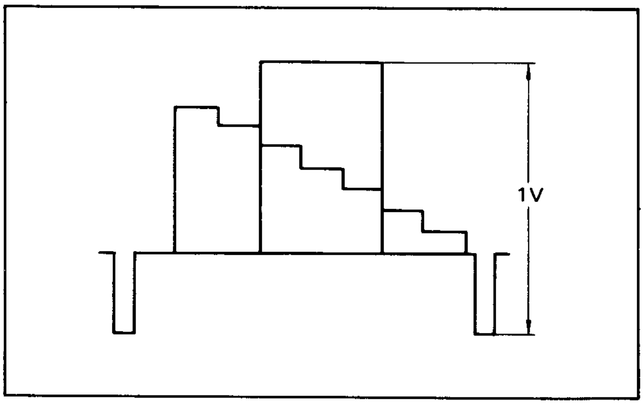


Fig. 26 Waveform of Video Output

6. Adjustment of audio output level: R890

1) Connect a colour bar generator to the aerial input terminal of VTR.
   [Generator] Output: –41 ± 10 dBm (1.58 mV – mV)
   MOD. signal: 400 Hz
   Modulation: AM 30%
2) Connect the oscilloscope to PG751 Pin 4.
3) Set the unit to the EE mode.
4) Tune the VTR for best reception by observing the picture on the screen.
5) Close the channel preset cover. (AFC switch: ON)
6) Adjust R890 so that the output level is equal -15 ± 1.5 dBm (84.1 mV – 118.9 mV).

7. Adjustment of AGC: R810

1) Connect the colour bar generator to the aerial input terminal of VTR.

[Generator] Output: -4.9 dBm (2.0 mV)
-44 dBm (3.55 mV)
Modulation degree: 87.5%

2) Set the unit to the EE mode.

3) Tune the VTR for best reception by observing the picture on the screen.

4) Close the channel preset cover. (AFC switch: ON)

5) Measure the voltage at the AGC terminal of tuner pack-pin 4 and adjust R810 so that the voltage is 9.2V ± 0.1V.

8. TUNER/IF CIRCUIT [For E model]

Adjust the tuner/IF section after removing the top cover and the shield cover of the IF section.

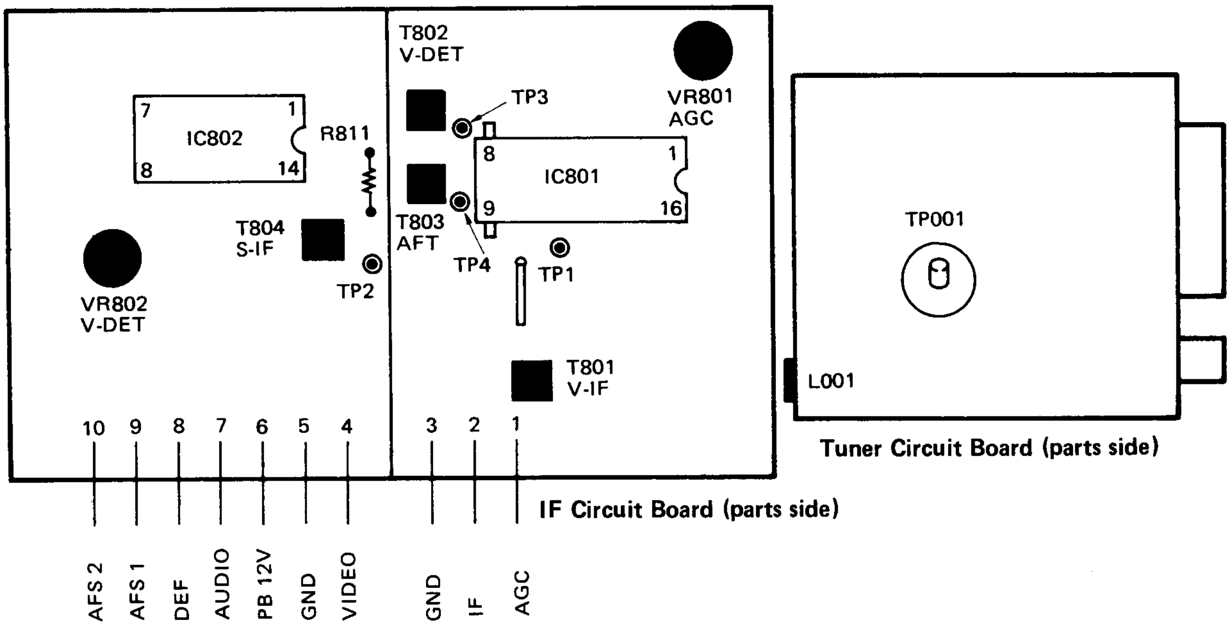

T802
V-DET
TP3
VR801
AGC
7
1
IC802
8
14
R811
8
1
IC801
9
16
T804
S-IF
T803
AFT
TP4
TP1
TP2
VR802
V-DET
T801
V-IF
TP001
L001
Tuner Circuit Board (parts side)
10 9 8 7 6 5 4 3 2 1
IF Circuit Board (parts side)
AFS 2
AFS 1
DEF
AUDIO
PB 12V
GND
VIDEO
GND
IF
AGC

Fig. 27 Tuner/IF Circuit Board (parts side)

1. Adjustment of carrier filter: T801

1) Connect the output of the TV-IF signal generator (markers, 31.9 MHz, 33.40 MHz, 34.47 MHz, 38.9 MHz, 40.4 MHz) to the IF input pins 2 and 3 (GND) of the IF circuit via the coupling circuit shown in Fig. 28.

2) Connect a resistor (50Ω) between TP3 and TP4, and then connect the oscilloscope to TP3.

3) Set the unit to the EE mode.

4) Adjust T801 so that the characteristics shown in Fig. 29 are obtained with sensitivity of the oscilloscope at max. and output of the TV-IF signal generator at the minimum required level.

5) Remove the resistor (50Ω) described in item 2) of "Connecting test equipment", after adjustment is completed.

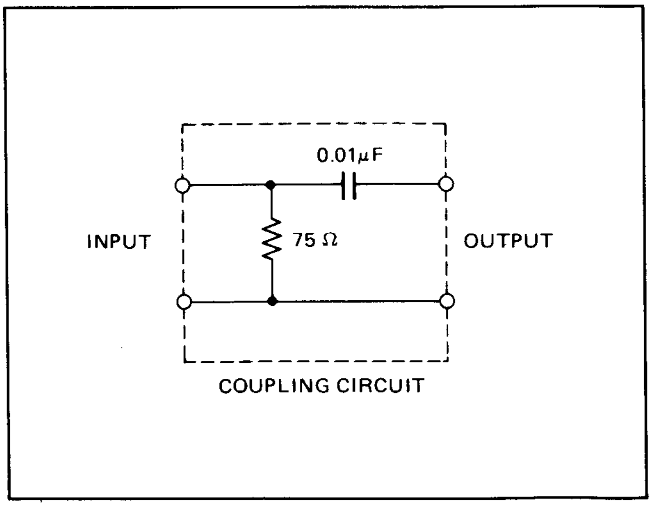

0.01μF
INPUT
75 Ω
OUTPUT
COUPLING CIRCUIT

Fig. 28 Coupling Circuit

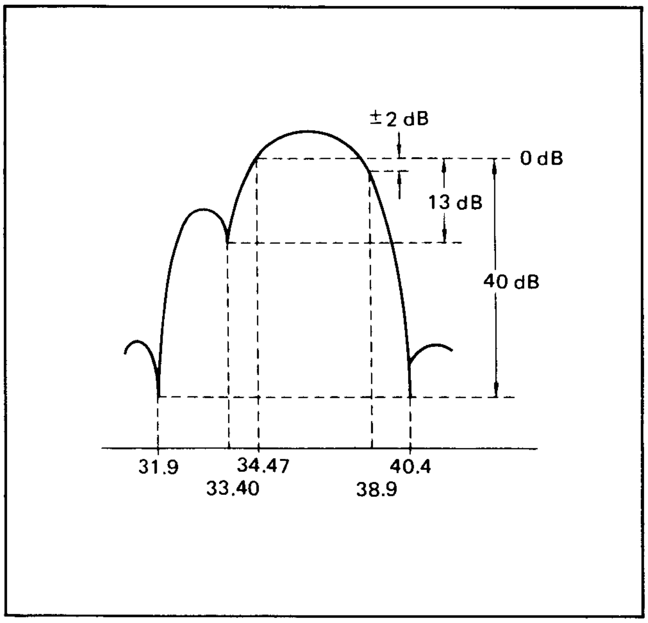


Fig. 29 Waveform of Video Output

2. Adjustment of V-DET: T802, VR802

1) Connect the output of the TV-IF signal generator (markers, 38.9 MHz, 34.47 MHz) to the IF input pins 2 and 3 (GND) of the IF circuit.
2) Connect the output (DC6 ~ 12V) of the DC power generator to the test point terminal TP1.
3) Connect the oscilloscope to R811 (T804 side) of the IF circuit.
4) Set the unit to the EE mode.
5) Adjust the output of the 38.9 MHz oscillator so that the input level of the IF input pin is 90 dBμ.
6) Set the oscilloscope to the DC mode and adjust the output voltage of the DC power generator so that the value (V_1) is -1.5V.
7) Adjust T802 so that V_1 is max. When V_1 is set to -1.5V ± 0.2V or more, readjust the output voltage of the DC power generator described in "Adjustment procedure (1)".
8) Adjust T802 so that the output of V_1 is max. and then set the oscilloscope to the "AC" mode. Adjust the output of the TV signal generator so waveform A shown in Fig. 30 is 1.2 Vp-p.
9) Check that the outputs at the 34.47 MHz and 38.9 MHz sections of the waveform are the same (B = C). Readjust V-IF (shown in item 1) when the outputs are very different.
10) Connect the oscilloscope to the video output pin 4 of the IF circuit. Adjust VR802 so that waveform A shown in Fig. 28 is 1.0 Vp-p.

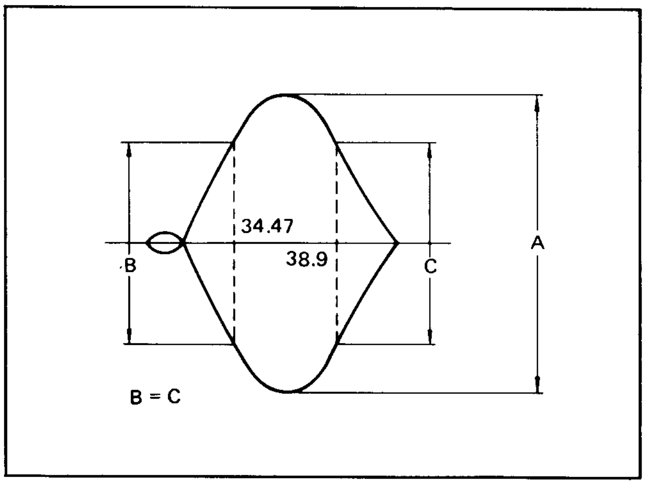


Fig. 30 V-DET

3. Adjustment of AFT: T803

1) Connect the output of the 38.9 MHz oscillator to the IF input pins 2 and 3 (GND) of the IF circuit via the coupling circuit shown in Fig. 31.

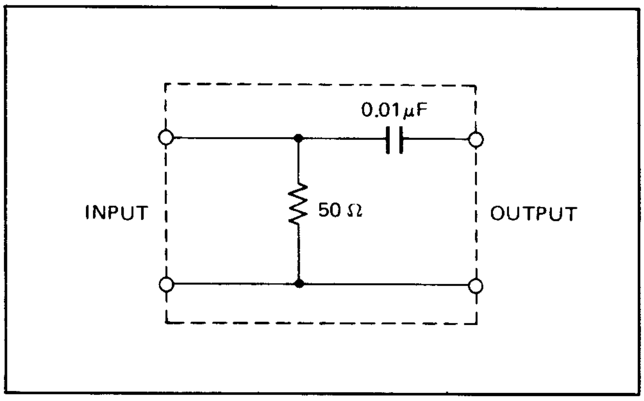


Fig. 31 Coupling Circuit

2) Connect the oscilloscope to the IFT output pins 9 and 10 of the IF circuit.
3) Set the unit to the EE mode.
4) Adjust the output of the 38.9 MHz oscillator so that the input level of the IF input pins 2 and 3 is 90 dBμ.
5) Set the oscilloscope to the "DC" mode and adjust T803 so that the potential difference between the IFT output pins 9 and 10 is not present.

4. Adjustment of SIF: T804

1) Connect a UHF or VHF antenna output to the VTR antenna input terminals.
2) Connect a TV set to the VTR.
3) Set the unit to the EE mode.
4) Select the channel with the best reception and adjust the set so that the station is tuned in properly.
5) Close the channel preset cover and set the AFS switch to ON.
6) Adjust T804 so that audio distortion is minimum and output is max.

5. Adjustment of PIF: L001

1) Connect the output of the TV signal generator to the VTR antenna input terminals and tune the set.
2) Connect the oscilloscope to the video output pin 4 of the IF circuit.
3) Set the unit to the EE mode.
4) Adjust L001 so that the characteristics shown in Fig. 32 can be obtained with sensitivity of the oscilloscope set to max. and output of the TV signal generator set to the min. required output.

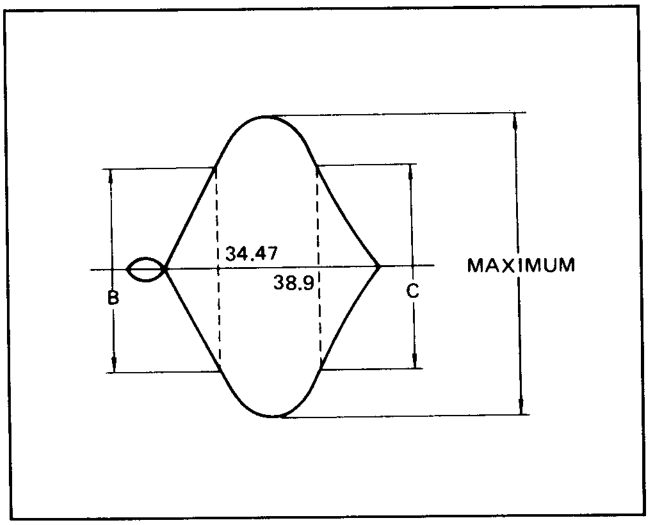


Fig. 32 PIF

6. Adjustment of video output level: VR802

1) Connect the output of the TV signal generator to the VTR antenna terminals, and tune the set.
2) Connect the oscilloscope to the video output pins 2 and 3 (GND) of the IF circuit.
3) Set the unit to the EE mode.
4) Adjust the output of the TV signal generator so that the output voltage at the test point terminal TP001 of the tuner is 80 dBμ.
5) Set the modulation signal of the TV signal generator to colour bar with modulation 87.5%.
6) Adjust VR802 so that the output waveform of the oscilloscope is 0.95V ± 0.03V.

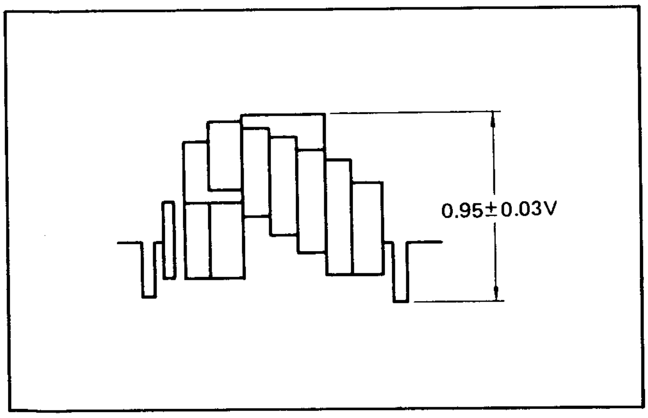


Fig. 33 Video Output Level

7. Adjustment of AGC: VR801

1) Connect the output of the signal generator to the VHF antenna terminals via the coupling circuit.
2) Connect the VTVM between pins 9 and 10 of IC801 in the IF circuit.

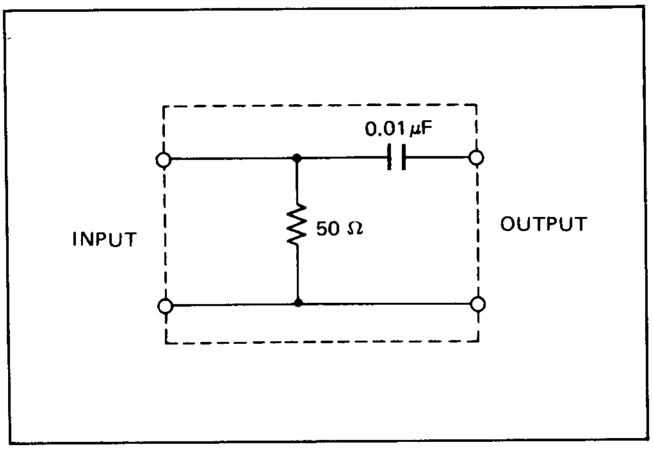


Fig. 34 Coupling Circuit

3) Set the unit to the EE mode.
4) Set the output signal of the signal generator to 203.25 MHz, 69 dBμ. (75Ω open)
5) Set the tuning VR of the VTR so that the reading of the VTVM is 0V (potential difference between pin 9 and 10 of the IF circuit).
6) Close channel preset cover and set the AFS switch to ON.
7) Connect the VTVM to the AGC output pin 1 in the IF circuit. Adjust VR801 so that the value at that time is 6.0 ± 0.5V.

MECHANICAL ADJUSTMENT

1. Inspection and adjustment of cassette loading mechanism

When the cassette is not placed in the specified position for 6 sec or more due to too tight winding of the tape in the cassette, a faulty DOWN switch, faulty installation of the DOWN switch or abnormal front loading mechanism during cassette loading, the cassette is ejected automatically.

When the cassette is locked midway and the cassette is not loaded or ejected and is left in the VTR, all operation button inputs are disabled to prevent tape damage.

Pull out the power plug and check the cassette loading mechanism at that time.

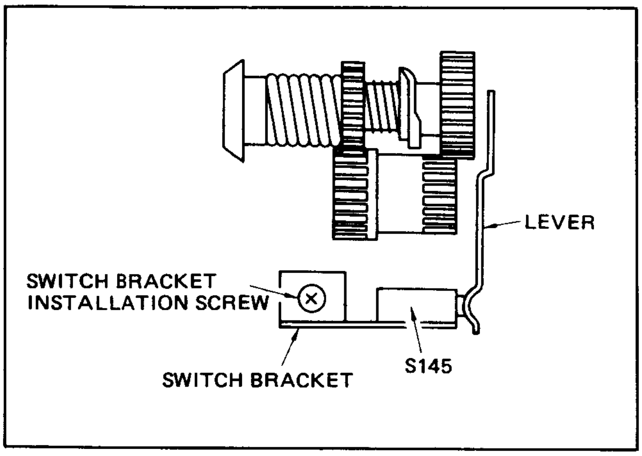

LEVER
SWITCH BRACKET INSTALLATION SCREW
SWITCH BRACKET
S145

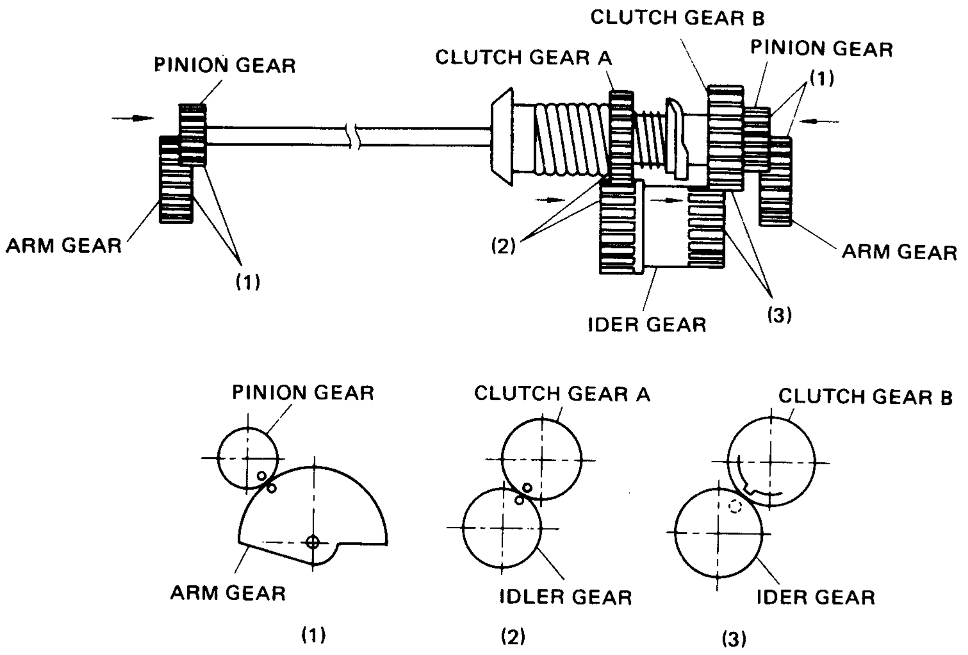
Fig. 1 Cassette-in Switch

1. Cassette-in switch installation adjustment

1) Remove the front panel and load a cassette.
2) Check that the switch knob is completely pushed when the lever is pressed in the direction of the arrow and that, on the other hand, the switch knob returns approx. 0.2 mm from the position when the lever is released, to check that the level shown in Fig. 1 is pressing the switch knob as much as required, after the cassette is loaded.
3) When the above value is not obtained, loosen the switch bracket installation screw shown in Fig. 1 to adjust the switch bracket installation.
4) Tighten the switch bracket installation screw after adjustment.

2. Checking the engagement of gears in the cassette loading mechanism

When the 4 engagements shown in Fig. 2 do not match when the cassette is loaded, the cassette loading mechanism does not operate normally, so check the engagement while removing these parts or when the cassette loading mechanism operation is faulty.


CLUTCH GEAR B
PINION GEAR
CLUTCH GEAR A
PINION GEAR
(1)
ARM GEAR
(1)
(2)
ARM GEAR
IDER GEAR
(3)
PINION GEAR
CLUTCH GEAR A
CLUTCH GEAR B
ARM GEAR
IDLER GEAR
IDER GEAR
(1)
(2)
(3)

* (1)~(3) shows the position relation viewed from the direction of the arrow.

Fig. 2 Checking the Engagement of Gears

2. Mechanism state sensor switch adjustment

The mechanism state switch is installed at the position near the supply reel at the bottom of the chassis. Adjust the installation position of the mechanism state switch according to the procedure shown below when the mechanism state switch is replaced.

1) Turn the pulley installed to the shaft of the worm gear in the loading mechanism by hand in the unloading direction until it stops.
2) Match the top of the triangular hole in the knob of the mechanism state sensor switch shown in Fig. 3 with the top of the triangle of the "STOP" position engraved on the body of the mechanism state switch.
3) Tighten the mechanism state switch fixing screw A and then load a blank tape and set the Stop ↔ F. FWD/Rewind ↔ REC/PLAY G REC-PAUSE ↔ PLAY ↔ Reverse visual search modes, to check that the mechanism operates normally. When the operation in any mode is faulty, readjust the mechanism state switch installation position.

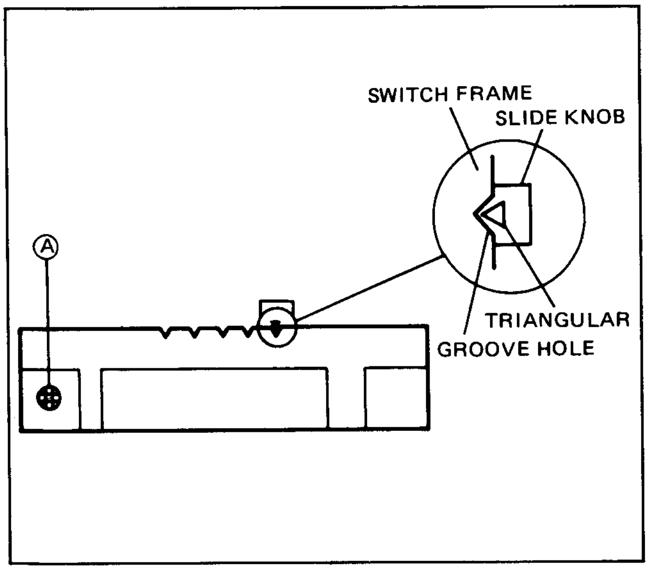


Fig. 3 Mechanism State Switch

3. Transport system adjustment

The adjustment items shown below are related to the tape transport system.

4. Reel disk height adjustment
5. Tension pole adjustment
6. Guide pole height adjustment
7. AC head height/azimuth/tilt adjustment
8. Guide roller height adjustment

With the tape transport system, it is basically most important that the route from the supply reel disk to the take-up reel disk shown in Fig. 4 is clean without creases and is stable. The tape transport system is adjusted precisely in the factory while paying utmost attention. When parts related to the tape transport system are replaced, the tape transport should be kept in alignment by adjusting only the replaced parts. When the adjustment of the parts is not done or parts other than those replaced are moved, the adjustment of the parts concerning the tape transport system may will become alignment resulting in unsatisfactory operation.

Do not loosen the fixing screws for the parts shown below. When parts are to be replaced due to breakage, etc., be sure to install the new parts to the same positions where the replaced parts were installed before, and then perform the precise adjustment described in the item "Guide roller height adjustment".

1) Catcher on the supply or take-up side.
2) Inclined guide on the supply.

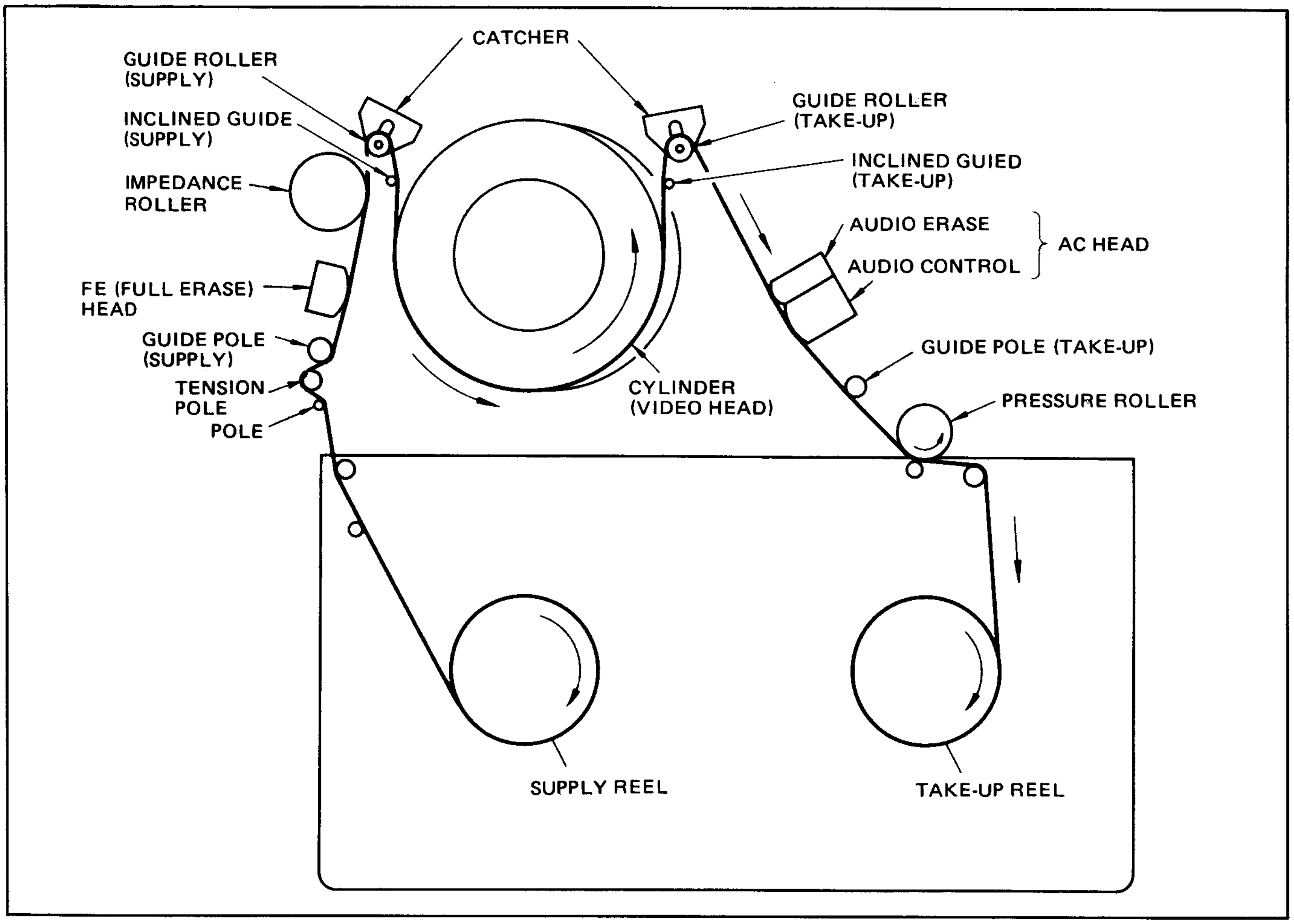

CATCHER
GUIDE ROLLER (SUPPLY)
INCLINED GUIDE (SUPPLY)
IMPEDANCE ROLLER
FE (FULL ERASE) HEAD
GUIDE POLE (SUPPLY)
TENSION POLE
POLE
GUIDE ROLLER (TAKE-UP)
INCLINED GUIED (TAKE-UP)
AUDIO ERASE
AUDIO CONTROL
AC HEAD
GUIDE POLE (TAKE-UP)
PRESSURE ROLLER
CYLINDER (VIDEO HEAD)
SUPPLY REEL
TAKE-UP REEL

Fig. 4 Transport System

4. Reel disk height adjustment

1) Remove the top panel and cassette holder.
2) Mount the master plane, place the reel height adjusting jig on the master plane as shown in Fig. 5, and check whether or not the reel disk enters between side A and side B of the reel height adjusting jig. When the reel disk does not enter between side A and side B, adjust the quantity of spacers (2 types: 0.25 mm and 0.5 mm) inserted between the reel disk and the base of the reel disk.

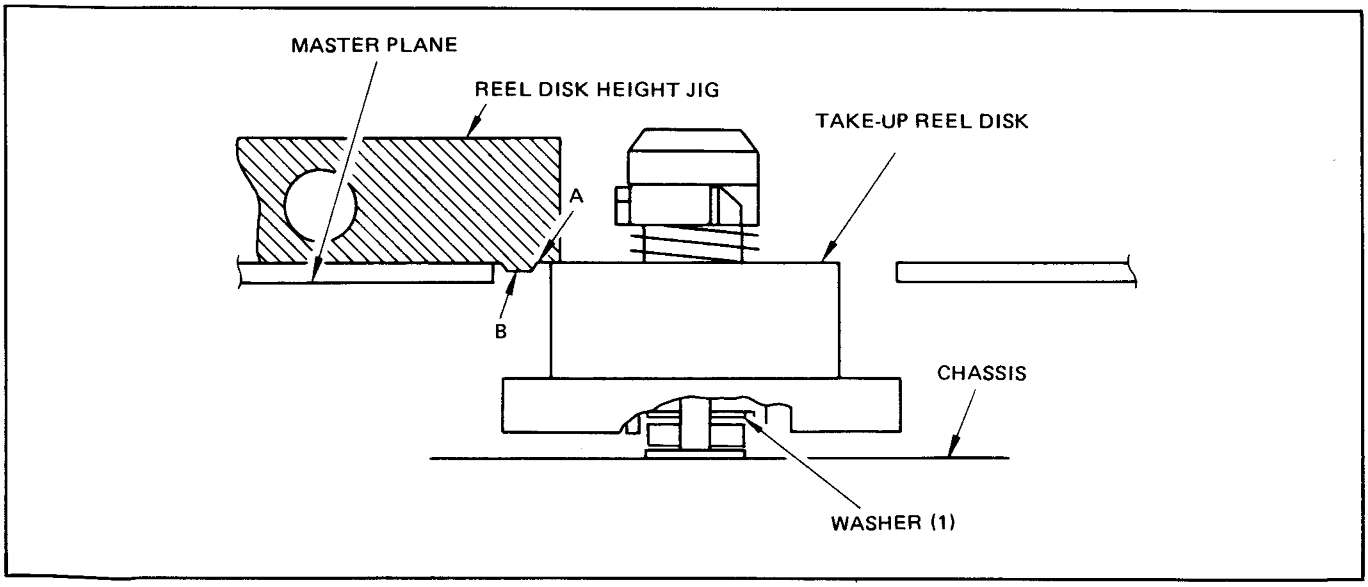

MASTER PLANE
REEL DISK HEIGHT JIG
TAKE-UP REEL DISK
A
B
CHASSIS
WASHER (1)

Fig. 5 Reel Disk Height

5. Tension pole position and back tension adjustment

Adjust and check the tension pole position and tension simultaneously.

When adjustment is performed, the VTR is placed in the play mode without a cassette tape. (Refer to P.51)

Position adjustment

1) Move the cassette holder as for loading without a tape loaded, and set the VTR to the play mode.
2) Loosen the tension band bracket fixing screw and apply a flat tip screwdriver to the bracket and the chassis groove.
3) Slide the tension band bracket using the flat tip screwdriver to set the interval between the tension pole and chassis to 3 ~ 4 mm.
4) Tighten the bracket fixing screw.
5) Move the cassette holder as for loading again without a tape after adjustment is completed, and check the tension pole position again.

Tension adjustment

1) Mount the back tension meter and set the VTR to the play mode.
2) Adjust so that the reading of the tension cassette is 30 ~ 40 g/cm.
3) Move the tension arm spring to the hooking position in direction (a) when the reading of the tension cassette is more than the specified value, and in direction (b) when it is less than the specified value, to set it to the specified value.
4) Confirm the tension pole position again when the tension position was greatly (6 g-cm or more) changed. When it is moved, re-adjust the tension pole position and tension.

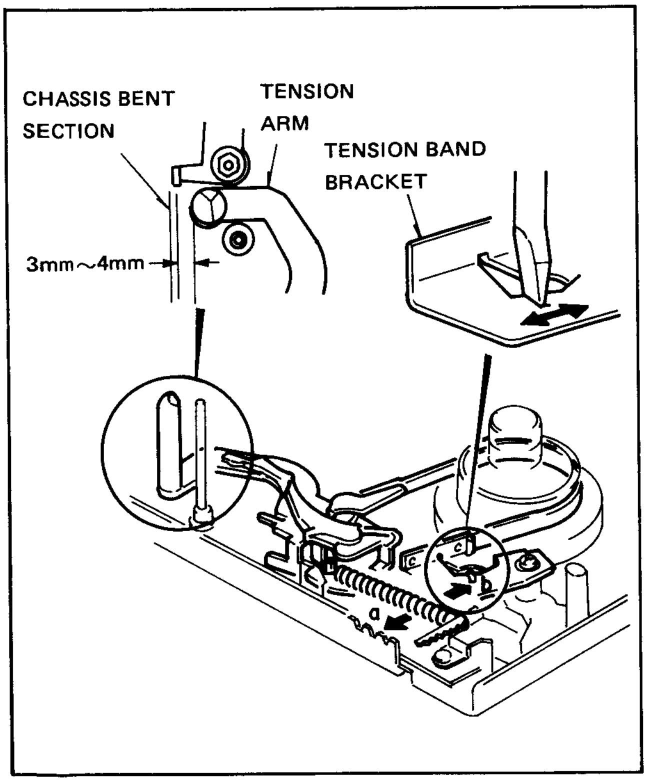


Fig. 6 Tension Pole Position and Back Tension

6. Guide pole height adjustment

Guide pole height adjustment: Perform rough adjustment using the master plane and reel height adjusting jig first, and then run a blank tape to adjust the height precisely.

1) Remove the tape panel and cassette holder.
2) Mount the master plane and place the reel height adjusting jig on the master plane shown in Fig. 7. Then, roughly adjust the guide pole height adjusting nut so that the gap between the flange of the guide pole and the reel height adjusting jig is within 0 ~ 0.2 mm when side C of the jig is applied to the guide pole.
3) Install the cassette holder, load a blank tape and play it back. Check that the tape does not ride over the flange of the guide pole.
   If adjustment incorrect, fine-adjust the guide pole height.
4) Tighten the adjusting nut and apply locking paint after adjustment is completed.

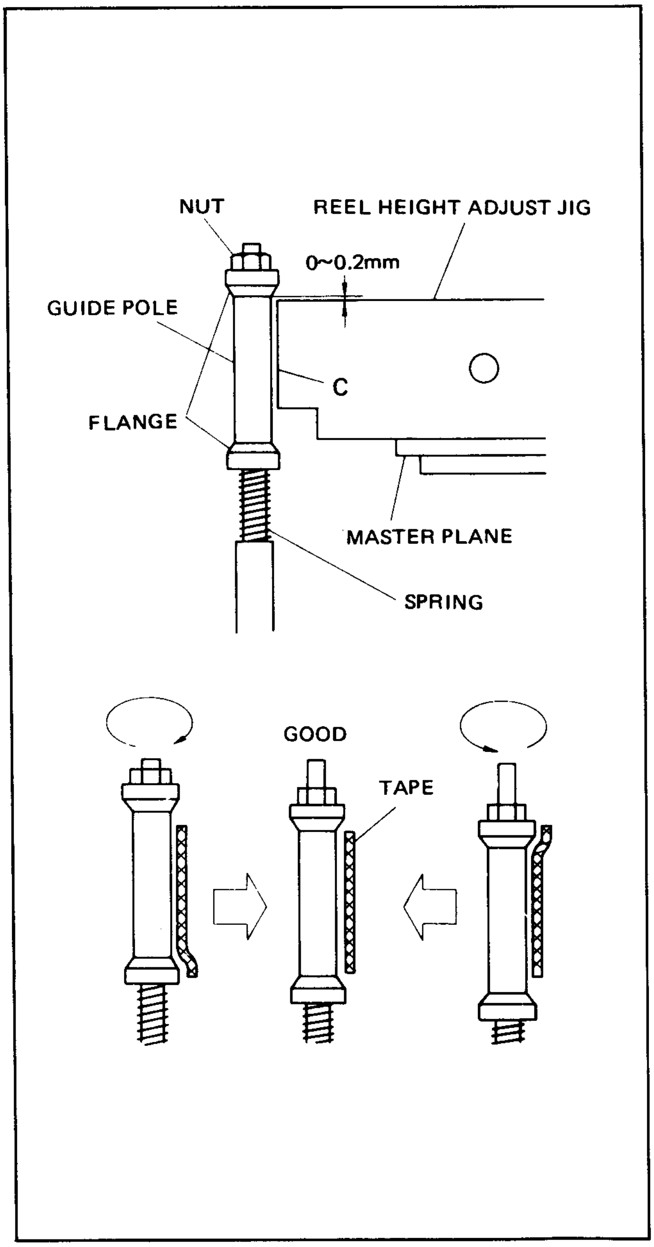


Fig. 7 Guide Pole Height

7. AC head adjustment

The AC head adjustment consists of the audio play output/ recording bias level adjustment described in the "Circuit adjustment" as well as the height/azimuth/tilt adjustments described in the following. Perform all these adjustments when the AC heads is replaced. The adjustment details below show the adjustment procedure when the AC head is replaced; to be sure to perform precise adjustment after rough adjustment.

(Rough adjustment)

1) Tighten the screw shown in Fig. 8 through the bottom of the head base (2) via the spring so that it projects approx. 3~4mm above the top of the AC head base (1).
2) Roughly adjust the tilt adjusting screw shown in Fig. 8 and azimuth adjusting screw so that the gap between the AC head base (1) and head base (2) is approx. 2.3 mm, and the AC head base (1) and head base (2) are parallel.
3) Remove the cassette holder and mount the master plane.
4) Place the reel height adjusting jig on the master plane as shown in Fig. 9. Then roughly adjust the AC head height adjusting nut so that the gap between the reel height adjusting jig and the shield case of the AC head is approx. 0.5 mm when the side C of jig is applied to the AC head.
5) Install the cassette holder, load a blank tape and set the VTR to the play mode. Check that there is no conspicuous curling or protruding around the AC head at that time. The ideal AC head height is with the bottom of the tape approx. shown Fig. 10, 0.3 mm from the bottom of the core of the CTL head. Roughly adjust the tilt adjusting screw, azimuth adjusting screw and AC head height adjusting nut when conspicuous curling or protruding occurs.
6) Perform precise adjustment.

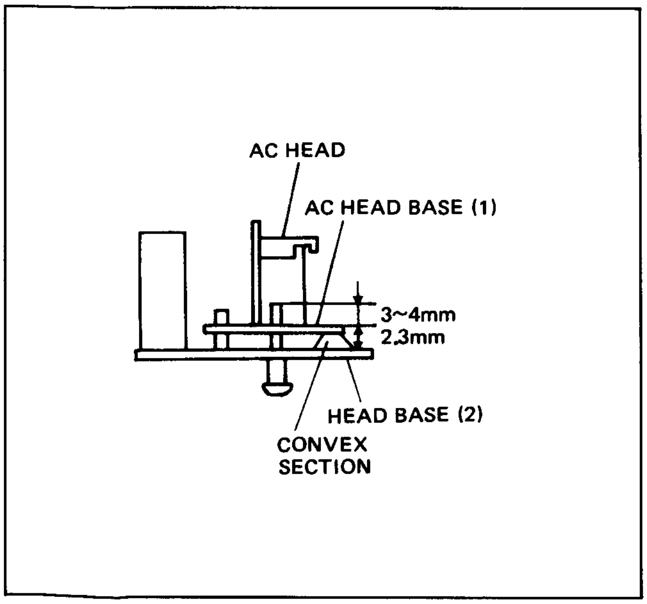


Fig. 8

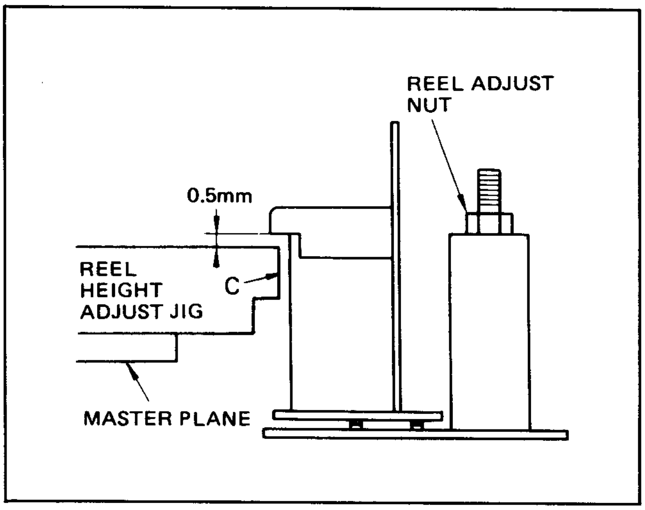


Fig. 9

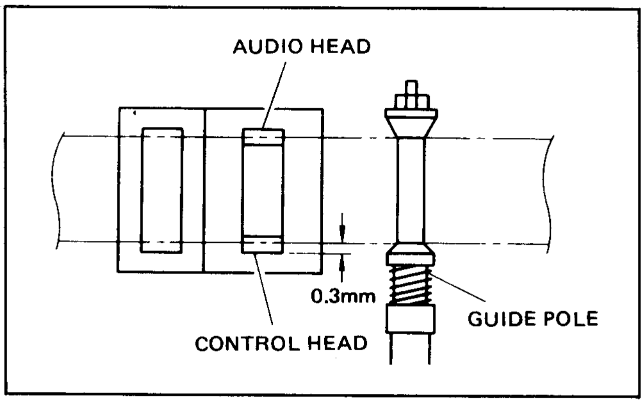


Fig. 10

(Fine adjustment)

1) Connect the L-ch audio output and CH-1 of the oscilloscope, and connect the R-ch audio output and CH-2.
2) Adjust FM audio (Linea audio) playback level controls RT2102 (RT401L), RT2202 (RT401R) described in the audio circuit adjustment for the maximum outputs.
3) Playback the audio 7 kHz signal on the alignment tape. Turn the adjustment screws for the tilt, azimuth and the AC head height alternately so the audio outputs from the both channels shown in Fig. 11 are maximum and the envelopes are flat and stable. When the audio output levels from the two channels differ, adjust the levels to their average value.
4) Confirm that the phases of both channels match. When they differ, readjust the azimuth adjustment screw.
5) Perform the playback level adjustment described in the audio circuit adjustment.
6) Connect channel-1 of the ocilloscope FM video output pin (TP202) of the Y/chroma P.C. Board.
7) Connect the oscilloscope to the FM audio output pin (TP2006) of the FM audio P.C. Board.
8) Short-circuit between TP2017 and ground.
9) Set the tracking control to its center click position and adjust the X value adjusting screw so that the

peak-to-peak value of the FM audio (FM video) is maximum.
Fig. 13 shows the variation characteristics of the peak-to-peak value of the FM audio (FM video) with respect to the turning of the tracking control when the X value is optimized using an alignment tape.

10) Check item 4 again.
11) Apply locking paint to the tilt adjusting screw, azimuth adjusting screw, AC head height adjusting nut and X value adjusting screws.
12) Adjust the play output and recording bias level as described in "Circuit adjustment".

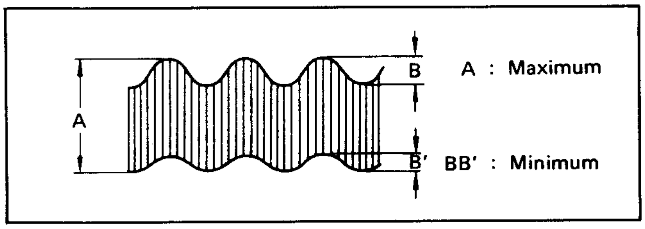


Fig. 11 FM Envelope (FM video)

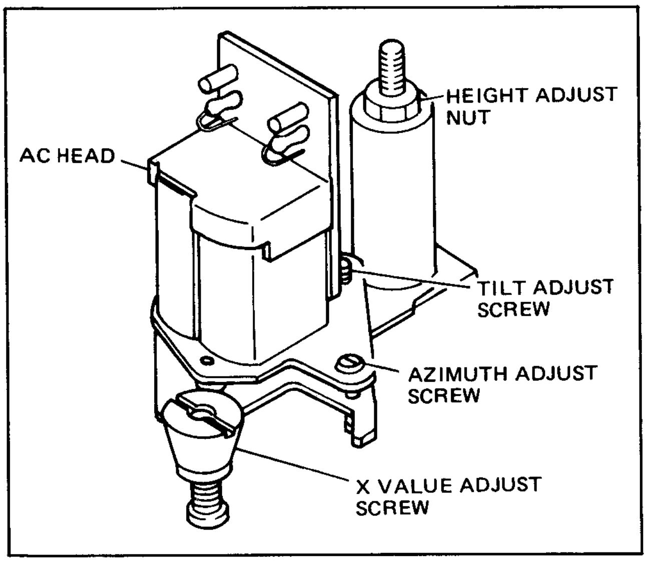


Fig. 12 Audio/Control Head

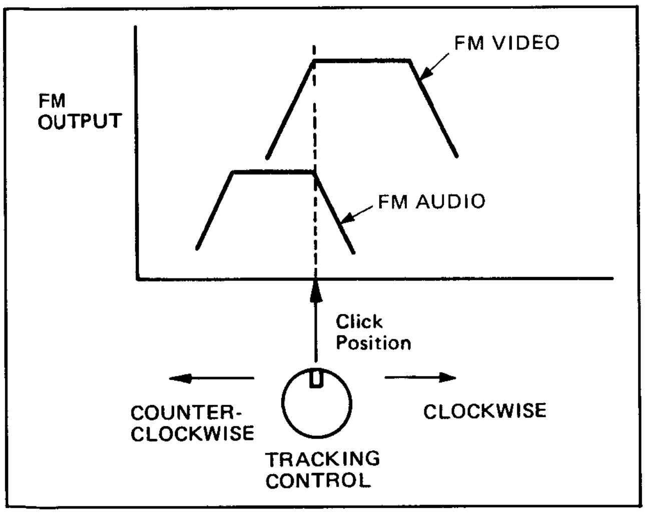


Fig. 13 X Value

8. Guide roller height adjustment

1) Remove the top panel and shield cover, and playback a blank tape. Check that conspicuous curling, protruding or lifting does not occur around the tape guide of the lower cylinder at that time.
When any curling, protruding or lifting occurs, place the VTR in the stop mode after checking the back tension, and then loosen the guide roller fixing screw shown in Fig. 14 to place the VTR to the play mode again, and roughly adjust the guide roller height.

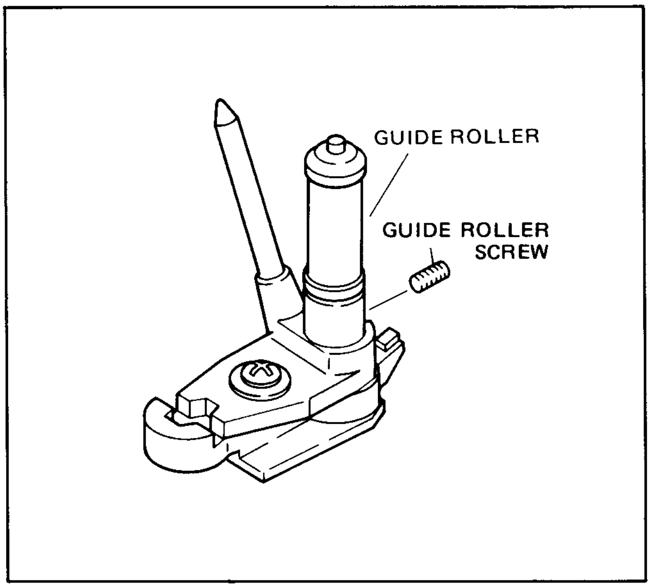


Fig. 14 Guider Roller

2) Connect the oscilloscope to the FM video output terminal TP202.
3) Playback the alignment tape and adjust the tracking VR at the front of the VTR so that the FM signal output is max. Turn the tracking VR in either direction so that the FM signal output is 75% of the max. value, after adjustment is completed.
4) Check the FM signal envelope; conspicuous fluctuations should not be present and the ratio between the max. section and min. section (this is called "flatness"), 60% or more. When the FM signal waveform is as shown in Fig. 15 and below the specifications shown above, adjust the supply guide roller. On the other hand when the waveform is as shown in Fig. 16 and over the specifications shown above, adjust the take-up guide roller. Do not turn the guide roller more than 1 turn, at that time.
5) Load a blank tape, and record the colour bar signal or a TV programme for 2 ~ 3 minutes in the "VTR" mode.
6) Playback the section recorded in item 5). Check that the FM signal envelope is within the specifications described in item 4).
7) Tighten the guide roller fixing screw after adjustment is completed.

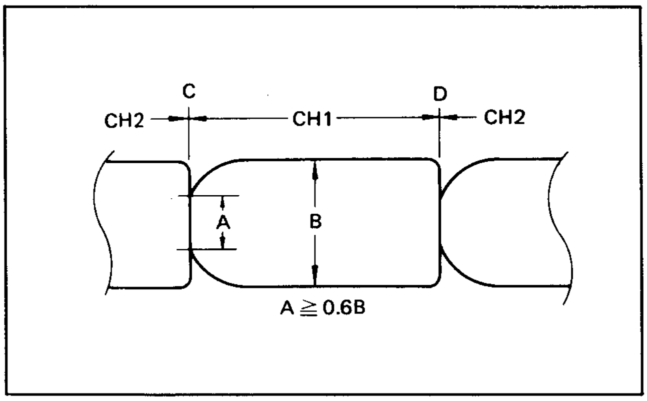


Fig. 15 Waveform

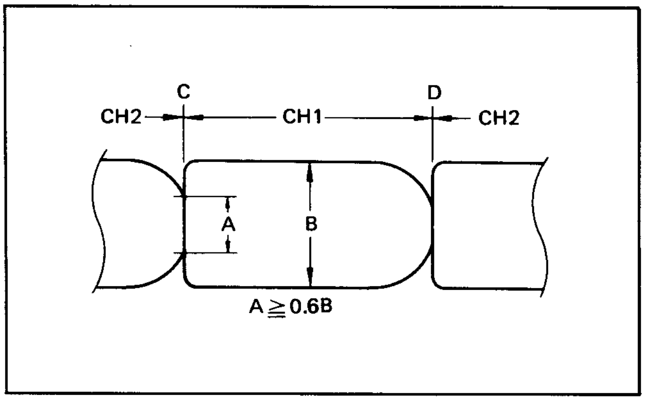


Fig. 16 Waveform

9. Compression strength and torque

* NOTE: HOW TO PLACE THE VTR TO AN OPERATION MODE WITHOUT A CASSETTE LOADED.

1. Cover up both tape sensor photo cells located midway on the both sides of the top mechanism.
2. Set the cassette in switch "ON".

Item	VTR Operation Mode	Measured Reel	Measurement Value	Remarks
Pressure roller compression strength	PLAY-PAUSE	–	1.2 ± 0.2 kg	Fig. 14
Main brake torque	STOP	Supply & take-up reels	170 g·cm or more	Note 1
Slack removal torque	Unloading	Supply reel	90 ~ 190 g·cm	Note 1
F. FWD torque	Fast-forward	Take-up reel	400 g·cm or more	Note 1
Rewind torque	Rewind	Supply reel	400 g·cm or more	Note 1
Take-up torque	Play	Take-up reel	90 ~ 180 g·cm	Note 1
Back tension	F. FWD	Supply reel	4 ~ 15 g·cm	Note 2
	Rewind	Take-up reel		

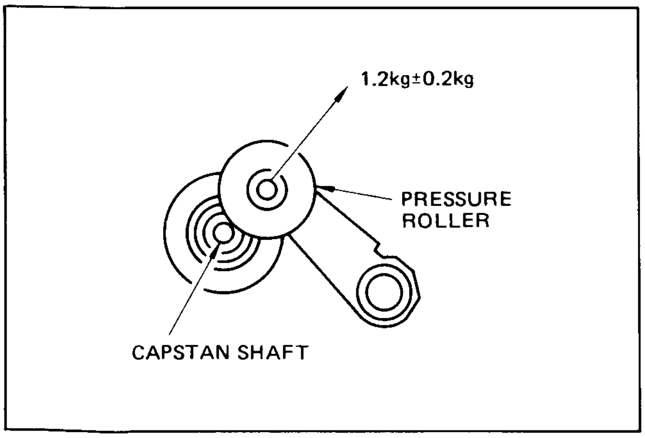


Fig. 17 Pressure Torque

Note 1: The value measured while sliding the torque gauge at the speed of 0.8 rps using the torque gauge and the torque gauge adaptor.
However, the main brake torque shows the value when measured while turning the take-up reel clockwise and the supply reel, counterclockwise by hand at the speed of 0.8 rps.

Note 2: The value measured while drawing the take-up reel disk counterclockwise and the supply reel disk, clockwise at the speed of 50 mm/s using the dummy reel and fan type tension gauge.

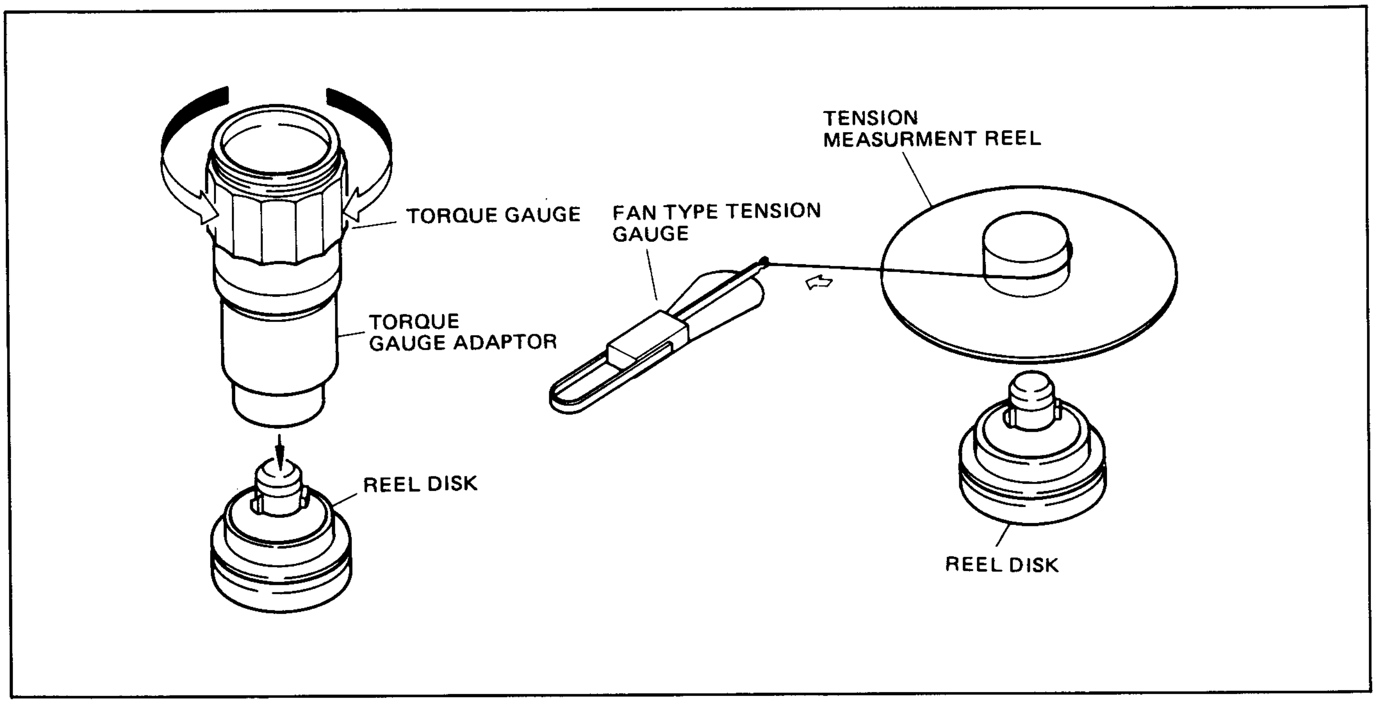
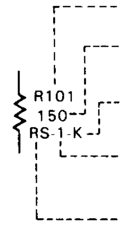

TORQUE GAUGE
TORQUE
GAUGE ADAPTOR
REEL DISK
FAN TYPE TENSION
GAUGE
TENSION
MEASURMENT REEL
REEL DISK

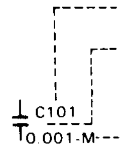
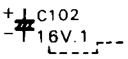
Fig. 18 Torque Gauge and Tension Measurement Reel

SCHEMATIC/CIRCUIT BOARD DIAGRAMS

Note

1. Voltage measured at base of chassis with minimum volume control and no signal.
   ( ) are shown in recording condition.
2. Nomenclature of Resistors and Capacitors.

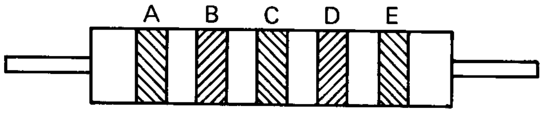
	Circuit No.	
	Value	No indicated Ω (Ohm) M : 1000kΩ
	Tolerance	No indicated ±5% K: ±10% M: ±20%
	Wattage	No indicated ¼ W
	Sort	No indicated Carbon film RC : Composition RW : Wire wound RS : Oxide metal film RN : Fixed metal film

	Circuit No.		
	Value	No indicated μF P : PF	
	Tolerance	No indicated ± 10% J : ± 5% M : ± 20% Z : + 80%, − 20% D : ± 0.5pF C : ± 0.25pF	
	Sort		Ceramic
		+ −	Electrolitic
		M	Mylar
		P	Polyester
		S	Styrol
	Voltage	No indicated 50WV	

3. Be sure to make your orders of resistors and capacitors with value, voltage, tolerance and sort.
4. When replacing capacitors marked With * use specified ones stated on parts list since required temperature characteristics.

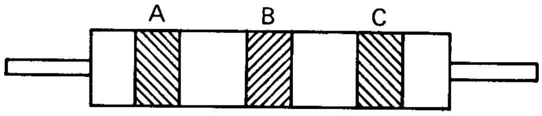
HOW TO READ CAPACITY AND INDUCTANCE OF RESISTOR SHAPE CAPACITORS AND COILS

CAPACITOR



CAPACITY: (10A+B)xC [PF]
TOLERANCE: D
RATED VOLTAGE: BODY COLOR
Pink: 25V
Green: 50V
CHARACTERISTICS: E

COIL



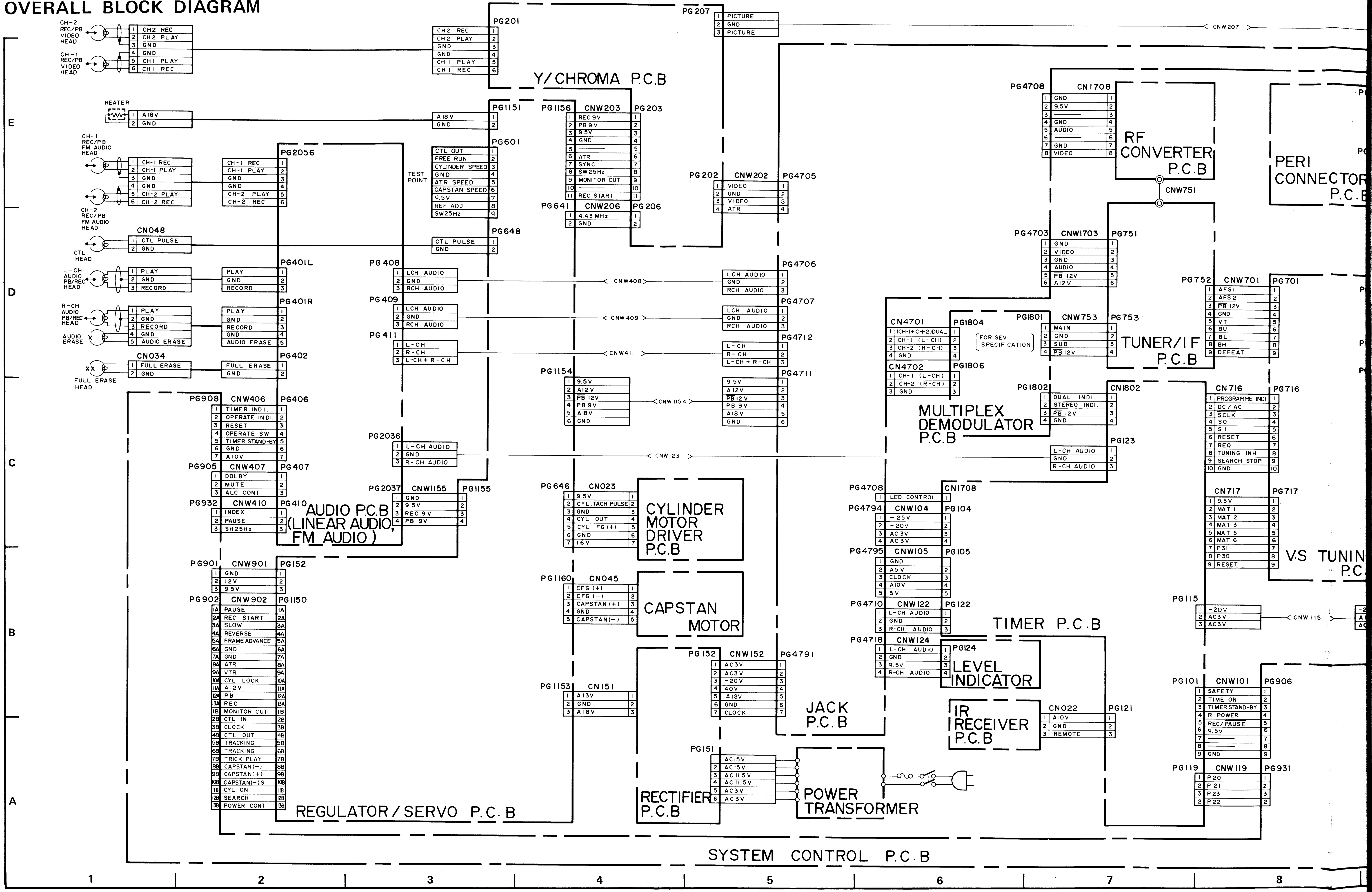
INDUCTANCE: (10A+B)xC [μH]

COLOR	A, B	C	D	E
Black	0	10^0	±20%	For temperature compensation
Brown	1	10^1		
Red	2	10^2		
Orange	3	10^3		
Yellow	4	10^4		
Green	5	10^5		
Blue	6			
Violet	7			
Grey	8		±30%	High dielectric constant type
White	9			For temperature compensation
Gold		10^{-1}	± 5%	
Silver		10^{-2}	±10%	High dielectric constant type

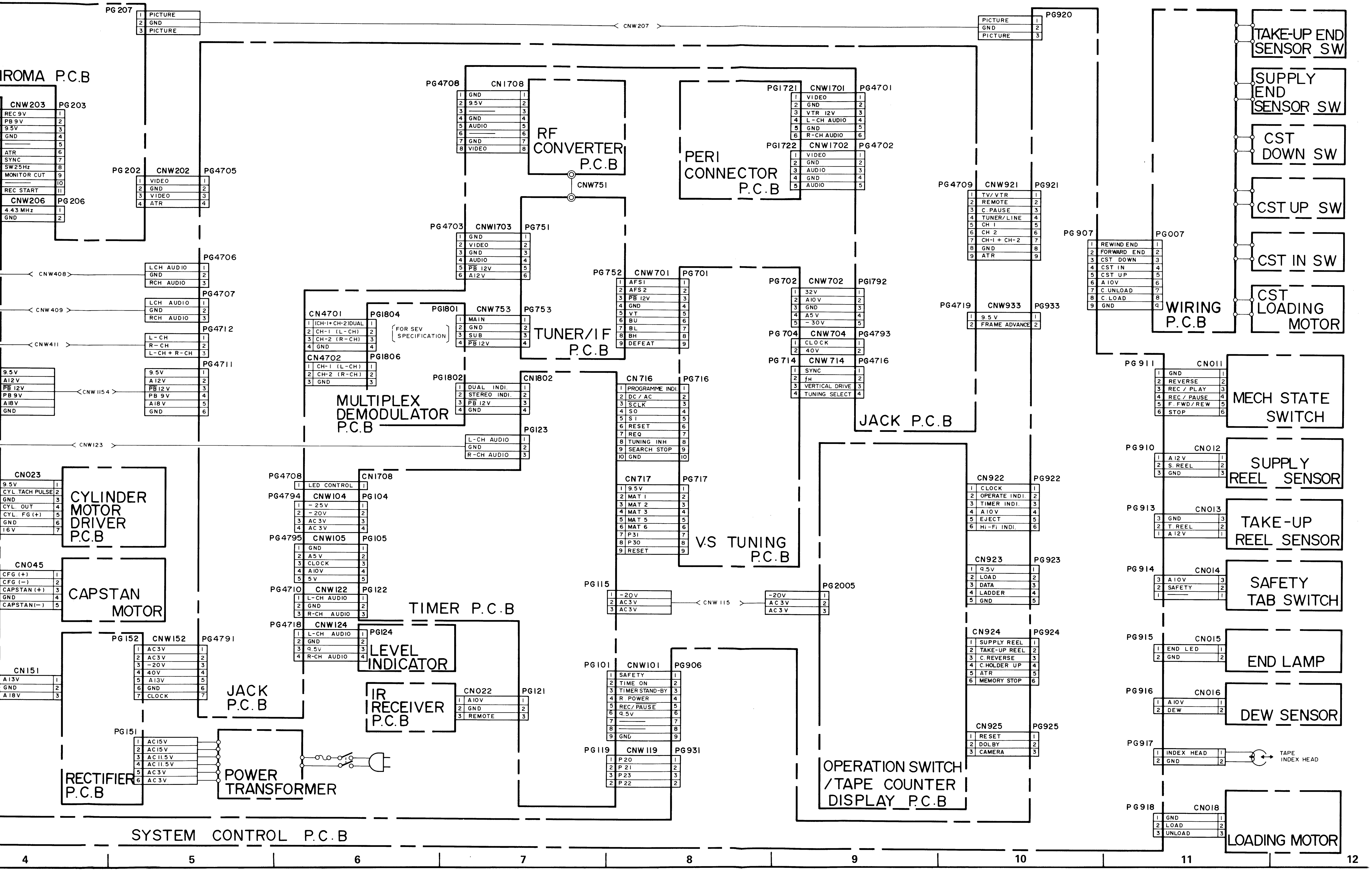
Cautions on use of MOS IC

1. The MOS IC is inserted in black foam for shipment. This foam is a conductor which short-circuits between the leads to prevent damage. Do not remove ICs from this foam during their storage. Avoid removing ICs from this foam, placing them on plastic which is likely to be charged with static electricity or inserting them into styrol foam.
2. High voltages may be applied during doldering caused by leakages from the soldering iron, so be sure to ground the tip of the soldering iron or use a low voltage soldering iron.
3. The human body, clothes made of synthetic fibres or nylon gloves may be charged with several thousands volts of static electricity because of friction, so a workers should be grounded.
4. Be sure to ground measuring instruments such as oscilloscopes, VTVMs, etc. used for repairs.

OVERALL BLOCK DIAGRAM



CH-2 REC/PB VIDEO HEAD
CH-1 REC/PB VIDEO HEAD
1 CH2 REC
2 CH2 PLAY
3 GND
4 GND
5 CH1 PLAY
6 CH1 REC
PG201
Y/CHROMA P.C.B
PG207
1 PICTURE
2 GND
3 PICTURE
CNW207
HEATER
1 A18V
2 GND
PG1151
PG1156
CNW203
PG203
1 REC 9V
2 PB 9V
3 9.5V
4 GND
6 ATR
7 SYNC
8 SW25Hz
9 MONITOR CUT
11 REC START
PG601
CTL OUT
FREE RUN
CYLINDER SPEED
GND
ATR SPEED
CAPSTAN SPEED
9.5V
REF. ADJ
SW25Hz
TEST POINT
CH-1 REC/PB FM AUDIO HEAD
CH-2 REC/PB FM AUDIO HEAD
PG2056
1 CH-1 REC
2 CH-1 PLAY
3 GND
4 GND
5 CH-2 PLAY
6 CH-2 REC
PG641
CNW206
PG206
1 4.43 MHz
2 GND
PG202
CNW202
PG4705
1 VIDEO
2 GND
3 VIDEO
4 ATR
CN048
CTL HEAD
1 CTL PULSE
2 GND
PG648
PG401L
L-CH AUDIO PB/REC HEAD
1 PLAY
2 GND
3 RECORD
PG408
1 LCH AUDIO
2 GND
3 RCH AUDIO
CNW408
PG4706
PG401R
R-CH AUDIO PB/REC HEAD
AUDIO ERASE
4 GND
5 AUDIO ERASE
PG409
CNW409
PG4707
PG411
1 L-CH
2 R-CH
3 L-CH + R-CH
CNW411
PG4712
CN034
FULL ERASE HEAD
1 FULL ERASE
2 GND
PG402
PG1154
1 9.5V
2 A12V
3 PB 12V
4 PB 9V
5 A18V
6 GND
CNW1154
PG4711
PG908
CNW406
PG406
1 TIMER INDI.
2 OPERATE INDI.
3 RESET
4 OPERATE SW
5 TIMER STAND-BY
6 GND
7 A10V
PG2036
1 L-CH AUDIO
2 GND
3 R-CH AUDIO
CNW123
PG905
CNW407
PG407
1 DOLBY
2 MUTE
3 ALC CONT
PG2037
CNW1155
PG1155
1 GND
2 9.5V
3 REC 9V
4 PB 9V
PG932
CNW410
PG410
1 INDEX
2 PAUSE
3 SH25Hz
AUDIO P.C.B (LINEAR AUDIO, FM AUDIO)
PG646
CN023
1 9.5V
2 CYL. TACH PULSE
3 GND
4 CYL. OUT
5 CYL. FG(+)
6 GND
7 16V
CYLINDER MOTOR DRIVER P.C.B
PG901
CNW901
PG152
1 GND
2 12V
3 9.5V
PG1160
CN045
1 CFG (+)
2 CFG (−)
3 CAPSTAN (+)
4 GND
5 CAPSTAN (−)
CAPSTAN MOTOR
PG902
CNW902
PG1150
1A PAUSE
2A REC START
3A SLOW
4A REVERSE
5A FRAME ADVANCE
6A GND
7A GND
8A ATR
9A VTR
10A CYL. LOCK
11A A12V
12A PB
13A REC
1B MONITOR CUT
2B CTL IN
3B CLOCK
4B CTL OUT
5B TRACKING
6B TRACKING
7B TRICK PLAY
8B CAPSTAN (−)
9B CAPSTAN (+)
10B CAPSTAN (−) S
11B CYL. ON
12B SEARCH
13B POWER CONT
REGULATOR / SERVO P.C.B
PG152
CNW152
PG4791
1 AC3V
2 AC3V
3 −20V
4 40V
5 A13V
6 GND
7 CLOCK
PG1153
CN151
1 A13V
2 GND
3 A18V
JACK P.C.B
PG151
1 AC15V
2 AC15V
3 AC11.5V
4 AC11.5V
5 AC3V
6 AC3V
RECTIFIER P.C.B
POWER TRANSFORMER
SYSTEM CONTROL P.C.B
PG4708
CN1708
1 GND
2 9.5V
4 GND
5 AUDIO
7 GND
8 VIDEO
RF CONVERTER P.C.B
CNW751
PERI CONNECTOR P.C.B
PG4703
CNW1703
PG751
1 GND
2 VIDEO
3 GND
4 AUDIO
5 PB 12V
6 A12V
CN4701
PG1804
1 (CH-1+CH-2) DUAL
2 CH-1 (L-CH)
3 CH-2 (R-CH)
4 GND
FOR SEV SPECIFICATION
PG1801
CNW753
PG753
1 MAIN
2 GND
3 SUB
4 PB 12V
TUNER/IF P.C.B
CN4702
PG1806
1 CH-1 (L-CH)
2 CH-2 (R-CH)
3 GND
PG1802
CN1802
1 DUAL INDI.
2 STEREO INDI.
3 PB 12V
4 GND
MULTIPLEX DEMODULATOR P.C.B
PG123
1 L-CH AUDIO
2 GND
3 R-CH AUDIO
PG752
CNW701
PG701
1 AFS1
2 AFS2
3 PB 12V
4 GND
5 VT
6 BU
7 BL
8 BH
9 DEFEAT
CN716
PG716
1 PROGRAMME INDI.
2 DC / AC
3 SCLK
4 SO
5 SI
6 RESET
7 REQ
8 TUNING INH
9 SEARCH STOP
10 GND
PG4708
CN1708
1 LED CONTROL
PG4794
CNW104
PG104
1 −25V
2 −20V
3 AC3V
4 AC3V
PG4795
CNW105
PG105
1 GND
2 A5V
3 CLOCK
4 A10V
5 5V
CN717
PG717
1 9.5V
2 MAT 1
3 MAT 2
4 MAT 3
5 MAT 5
6 MAT 6
7 P31
8 P30
9 RESET
V.S TUNING P.C
PG4710
CNW122
PG122
1 L-CH AUDIO
2 GND
3 R-CH AUDIO
TIMER P.C.B
PG115
1 −20V
2 AC3V
3 AC3V
CNW115
PG4718
CNW124
PG124
1 L-CH AUDIO
2 GND
3 9.5V
4 R-CH AUDIO
LEVEL INDICATOR
IR RECEIVER P.C.B
CN022
PG121
1 A10V
2 GND
3 REMOTE
PG101
CNW101
PG906
1 SAFETY
2 TIME ON
3 TIMER STAND-BY
4 R POWER
5 REC / PAUSE
6 9.5V
9 GND
PG119
CNW119
PG931
1 P20
2 P21
3 P23
2 P22
E
D
C
B
A
1
2
3
4
5
6
7
8


PG 207
PICTURE
GND
PICTURE
CNW 207
PG920
IROMA P.C.B
CNW203
PG203
REC 9V
PB 9V
9.5V
GND
ATR
SYNC
SW25Hz
MONITOR CUT
REC START
CNW206
PG 206
4.43 MHz
GND
PG 202
CNW202
PG4705
VIDEO
GND
VIDEO
ATR
PG4708
CN1708
9.5V
AUDIO
VIDEO
RF CONVERTER P.C.B
CNW751
PG1721
CNW1701
PG4701
VTR 12V
L-CH AUDIO
R-CH AUDIO
PG1722
CNW1702
PG4702
PERI CONNECTOR P.C.B
TAKE-UP END SENSOR SW
SUPPLY END SENSOR SW
CST DOWN SW
CST UP SW
CST IN SW
CST LOADING MOTOR
PG4709
CNW921
PG921
TV/VTR
REMOTE
C. PAUSE
TUNER/LINE
CH 1
CH 2
CH-1 + CH-2
PG 907
PG007
REWIND END
FORWARD END
CST DOWN
CST IN
CST UP
A10V
C. UNLOAD
C. LOAD
WIRING P.C.B
PG4703
CNW1703
PG751
PB 12V
A12V
PG4706
LCH AUDIO
RCH AUDIO
CNW408
PG4707
CNW409
PG4712
L-CH
R-CH
L-CH + R-CH
CNW411
PG4711
A12V
PB 12V
PB 9V
A18V
CNW1154
CNW123
PG752
CNW701
PG701
AFS1
AFS2
VT
BU
BL
BH
DEFEAT
PG702
CNW702
PG1792
32V
A10V
A5V
−30V
PG4719
CNW933
PG933
FRAME ADVANCE
CN4701
PG1804
(CH-1+CH-2)DUAL
CH-1 (L-CH)
CH-2 (R-CH)
CN4702
PG1806
PG1801
CNW753
PG753
MAIN
SUB
FOR SEV SPECIFICATION
TUNER/IF P.C.B
PG704
CNW704
PG4793
CLOCK
40V
PG714
CNW714
PG4716
SYNC
fH
VERTICAL DRIVE
TUNING SELECT
PG1802
CN1802
DUAL INDI.
STEREO INDI.
MULTIPLEX DEMODULATOR P.C.B
PG123
L-CH AUDIO
R-CH AUDIO
CN716
PG716
PROGRAMME INDI.
DC/AC
SCLK
SO
SI
RESET
REQ
TUNING INH
SEARCH STOP
JACK P.C.B
PG911
CN011
REVERSE
REC/PLAY
REC/PAUSE
F.FWD/REW
STOP
MECH STATE SWITCH
PG910
CN012
S. REEL
SUPPLY REEL SENSOR
PG913
CN013
T. REEL
TAKE-UP REEL SENSOR
PG914
CN014
SAFETY
SAFETY TAB SWITCH
PG915
CN015
END LED
END LAMP
PG916
CN016
DEW
DEW SENSOR
PG917
INDEX HEAD
TAPE INDEX HEAD
PG918
CN018
LOAD
UNLOAD
LOADING MOTOR
CN023
CYL. TACH PULSE
CYL. OUT
CYL. FG (+)
16V
CYLINDER MOTOR DRIVER P.C.B
CN045
CFG (+)
CFG (−)
CAPSTAN (+)
CAPSTAN (−)
CAPSTAN MOTOR
CN151
A13V
PG4708
CN1708
LED CONTROL
PG4794
CNW104
PG104
−25V
−20V
AC3V
PG4795
CNW105
PG105
PG4710
CNW122
PG122
PG4718
CNW124
PG124
LEVEL INDICATOR
TIMER P.C.B
CN717
PG717
MAT 1
MAT 2
MAT 3
MAT 5
MAT 6
P31
P30
V.S TUNING P.C.B
CN922
PG922
OPERATE INDI.
TIMER INDI.
EJECT
Hi-Fi INDI.
CN923
PG923
DATA
LADDER
PG115
PG2005
CNW 115
AC3V
CN924
PG924
SUPPLY REEL
TAKE-UP REEL
C. REVERSE
C. HOLDER UP
MEMORY STOP
CN925
PG925
DOLBY
CAMERA
PG 152
CNW152
PG4791
40V
JACK P.C.B
IR RECEIVER P.C.B
CN022
PG121
REMOTE
PG101
CNW101
PG906
TIME ON
TIMER STAND-BY
R. POWER
REC/PAUSE
PG119
CNW 119
PG931
P20
P21
P23
P22
OPERATION SWITCH /TAPE COUNTER DISPLAY P.C.B
PG151
AC15V
AC11.5V
RECTIFIER P.C.B
POWER TRANSFORMER
SYSTEM CONTROL P.C.B
4
5
6
7
8
9
10
11
12

TUNER IF [For UK model]

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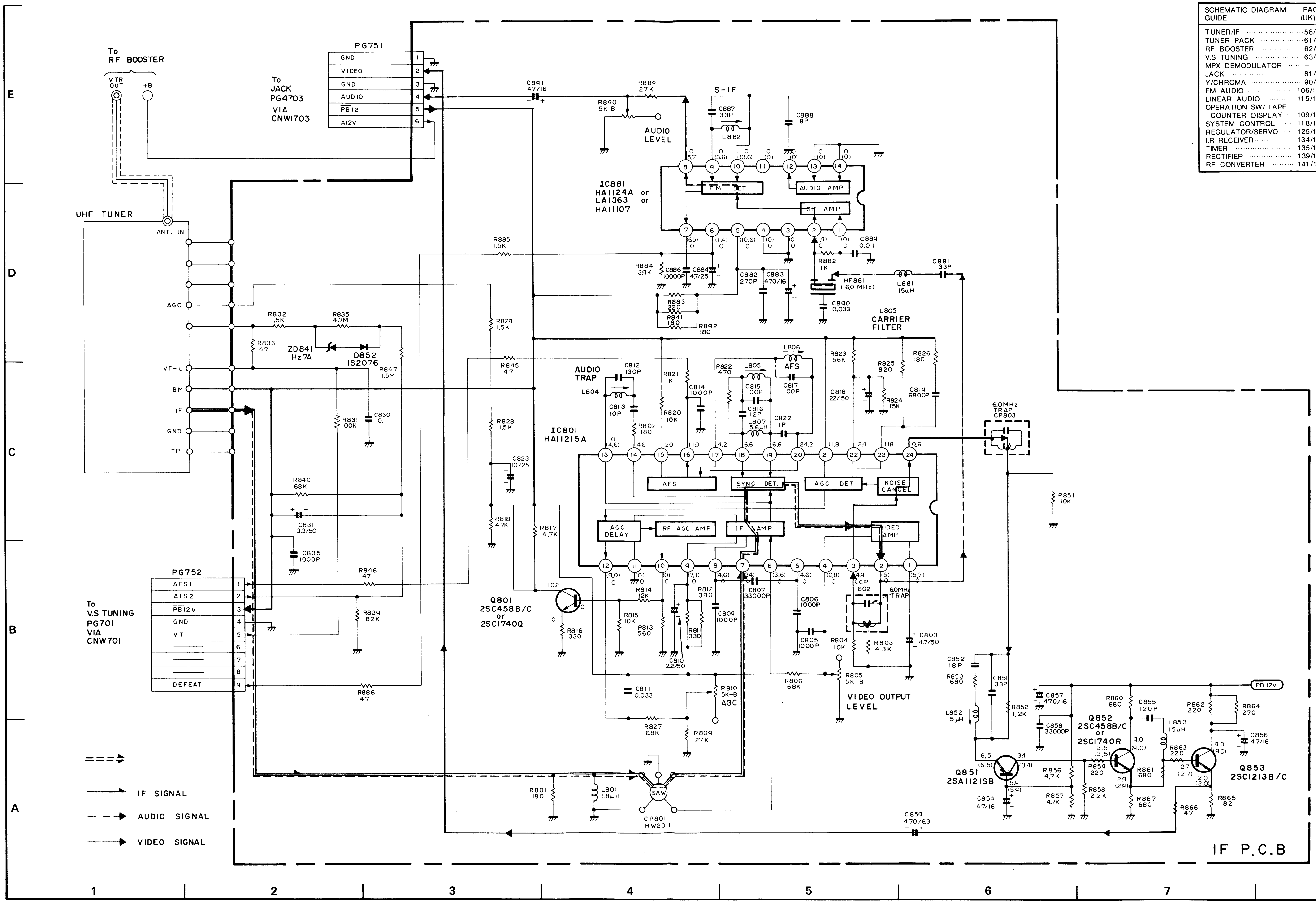
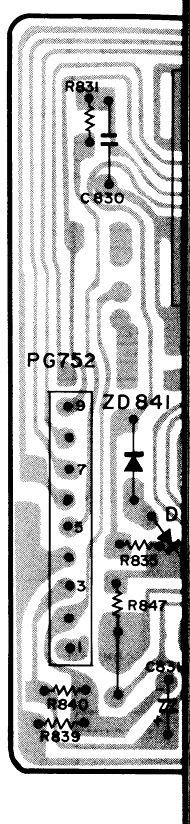

To RF BOOSTER
VTR OUT
+B
PG751
GND
VIDEO
GND
AUDIO
PB12
A12V
To JACK PG4703 VIA CNW1703
C891 47/16
R889 27K
R890 5K-B
AUDIO LEVEL
S-IF
C887 33P
L882
C888 8P
IC881 HA11124A or LA1363 or HA11107
FM DET
AUDIO AMP
SIF AMP
C889 0.01
R882 1K
HF881 (6.0 MHz)
C890 0.033
L881 15uH
C881 33P
UHF TUNER
ANT. IN
AGC
VT-U
BM
IF
GND
TP
R885 1.5K
R884 3.9K
C886 10000P
C884 47/25
C882 270P
C883 470/16
R883 220
R841 180
R842 180
L805 CARRIER FILTER
R832 1.5K
R835 4.7M
R833 47
ZD841 Hz7A
D852 1S2076
R847 1.5M
R829 1.5K
R845 47
AUDIO TRAP
C812 130P
L804
C813 10P
R802 180
R821 1K
C814 1000P
R820 10K
R822 470
L805
L806
AFS
C815 100P
C816 12P
L807 5.6uH
C822 1P
C817 100P
R823 56K
C818 22/50
R825 820
R824 15K
R826 180
C819 6800P
6.0MHz TRAP CP803
R831 100K
C830 0.1
R828 1.5K
IC801 HA11215A
AFS
SYNC DET.
AGC DET
NOISE CANCEL
AGC DELAY
RF AGC AMP
IF AMP
VIDEO AMP
C823 10/25
R840 68K
C831 3.3/50
C835 1000P
R818 4.7K
R817 4.7K
PG752
AFS1
AFS2
PB12V
GND
VT
DEFEAT
To V.S TUNING PG701 VIA CNW701
R846 47
R834 82K
R886 47
Q801 2SC458B/C or 2SC1740Q
R816 330
R814 12K
R815 10K
R813 560
R812 390
R811 330
C810 2.2/50
C809 1000P
C807 33000P
C806 1000P
C805 1000P
R804 10K
CP 802 6.0MHz TRAP
R803 4.3K
C803 47/50
R851 10K
C811 0.033
R810 5K-B AGC
R827 6.8K
R809 27K
R806 68K
R805 5K-B
VIDEO OUTPUT LEVEL
C852 18P
R853 680
C851 33P
L852 15uH
R852 1.2K
C857 470/16
C858 33000P
R860 680
C855 120P
L853 15uH
R862 220
R864 270
PB 12V
C856 47/16
Q852 2SC458B/C or 2SC1740R
R863 220
Q853 2SC1213B/C
Q851 2SA1121SB
R856 4.7K
R859 220
R861 680
R858 2.2K
R857 4.7K
R867 680
R866 47
R865 82
C854 47/16
C859 470/63
R801 180
L801 1.8uH
SAW
CP801 HW2011
IF SIGNAL
AUDIO SIGNAL
VIDEO SIGNAL
IF P.C.B
A
B
C
D
E
1
2
3
4
5
6
7
8


R831
C830
PG752
ZD841
R835
R847
R840
R839

1	GND
2	VIDEO
3	GND
4	AUDIO
5	PB12
6	A12

PG751

To JACK PG4703 VIA CNW1703

IF [For UK model]

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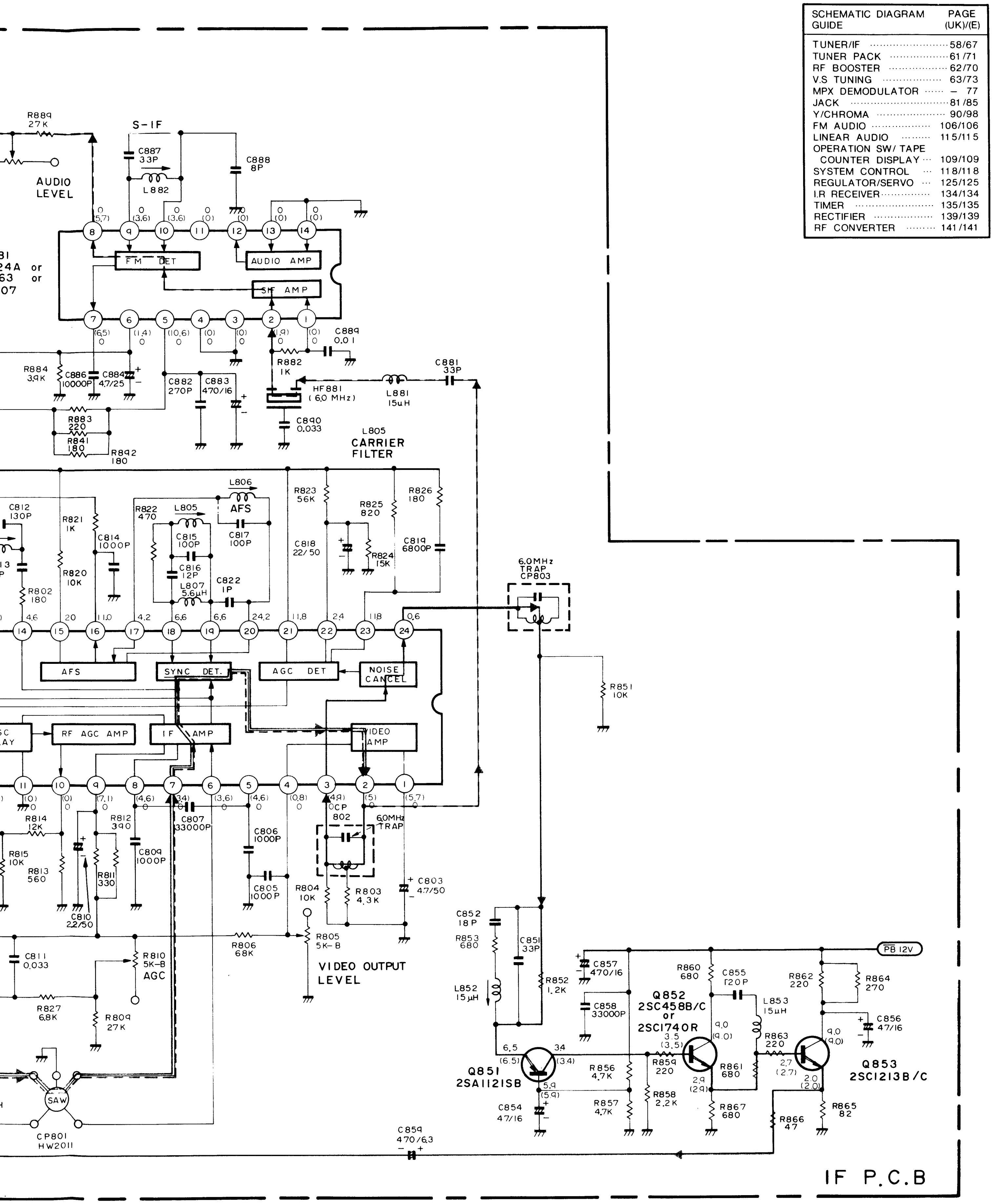
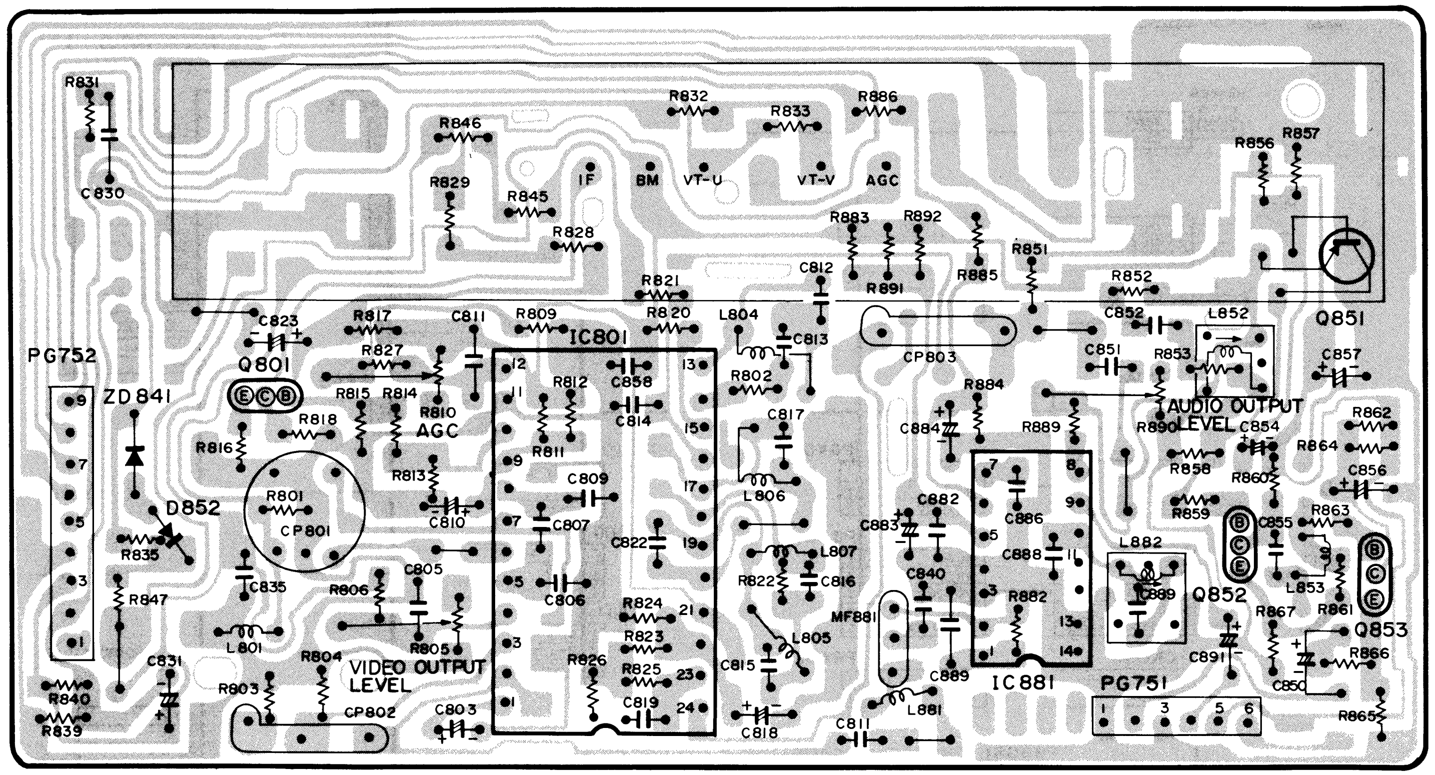


S-IF
R889 27K
AUDIO LEVEL
C887 33P
L882
C888 8P
FM DET
AUDIO AMP
SIF AMP
C889 0.01
R884 3.9K
C886 10000P
C884 47/25
C882 270P
C883 470/16
R882 1K
HF881 (6.0 MHz)
L881 15uH
C881 33P
C890 0.033
R883 220
R841 180
R842 180
L805 CARRIER FILTER
L806
AFS
C812 130P
R821 1K
C814 1000P
R822 470
C815 100P
C816 12P
L807 5.6uH
C817 100P
C822 1P
R823 56K
C818 22/50
R825 820
R824 15K
R826 180
C819 6800P
R802 180
R820 10K
AFS
SYNC DET.
AGC DET
NOISE CANCEL
6.0MHz TRAP CP803
R851 10K
RF AGC AMP
IF AMP
VIDEO AMP
R814 12K
R812 390
R811 330
C809 1000P
C807 33000P
C806 1000P
C805 1000P
CP 802
6.0MHz TRAP
R815 10K
R813 560
C810 22/50
R804 10K
R803 4.3K
C803 47/50
C811 0.033
R810 5K-B AGC
R806 68K
R805 5K-B
VIDEO OUTPUT LEVEL
R827 6.8K
R809 27K
SAW
CP801 HW2011
C852 18P
R853 680
C851 33P
L852 15μH
R852 1.2K
PB 12V
C857 470/16
C858 33000P
R860 680
C855 120P
L853 15μH
R862 220
R864 270
C856 47/16
Q852 2SC458B/C or 2SC1740R
R863 220
Q851 2SA1121SB
R856 4.7K
R859 220
R858 2.2K
R861 680
Q853 2SC1213B/C
C854 47/16
R857 4.7K
R867 680
R866 47
R865 82
C859 470/6.3
IF P.C.B



R831
C830
R832
R833
R886
R846
R829
R845
IF
BM
VT-U
VT-V
AGC
R856
R857
R828
R883
R892
R891
R885
R851
R821
C812
R852
Q851
PG752
C823
R817
C811
R809
R820
IC801
L804
C813
CP803
C852
L852
C851
R853
C857
Q801
R827
C858
R812
R802
R884
AUDIO OUTPUT LEVEL
ZD841
R815
R814
R810 AGC
C814
C817
C884
R889
R890
C854
R862
R816
R818
R811
R813
C809
L806
R858
R860
R864
C856
D852
R801
CP801
C810
C807
C822
C883
C882
C886
R859
C855
R863
R835
L807
C888
L882
C889
Q852
Q853
R847
C835
R806
C805
C806
R824
R822
C816
C840
R882
L853
R861
R867
L801
R805
R823
MF881
L805
C891
R866
C831
R804
VIDEO OUTPUT LEVEL
R826
R825
C815
C889
IC881
PG751
R840
R803
CP802
C803
C819
L881
C850
R865
R839
C818
C811

TUNER / IF P. C. B

PG751

1	GND
2	VIDEO
3	GND
4	AUDIO
5	$\overline{\text{PB}}$12
6	A12

To
JACK
PG4703
VIA
CNW1703

PG752

1	AFS 1
2	AFS 2
3	$\overline{\text{PB}}$12V
4	GND
5	VT
6	BU
7	BL
8	BH
9	DEFEAT

To
V.S TUNING
PG701
VIA
CNW701

IC801

12	0 (9)	13	0(4.6)
11	0 (0)	14	4.6
10	0 (0)	15	2.0
9	0 (7.1)	16	11.0
8	0 (4.6)	17	4.2
7	0 (3.4)	18	6.6
6	0 (3.6)	19	6.6
5	0 (4.6)	20	24.2
4	0 (0.8)	21	11.8
3	0 (4.9)	22	2.4
2	0 (5)	23	11.8
1	0 (5.7)	24	0.6

IC881

7	0(6.5)	8	0(5.7)
6	0(1.4)	9	0(3.6)
5	0(10.6)	10	0(3.6)
4	0(0)	11	0(0)
3	0(0)	12	0(0)
2	0(1.9)	13	0(0)
1	0(0)	14	0(0)

Q801

B	0(0)
C	0(10.2)
E	0(0)

Q852

B	0(3.5)
C	0(9.0)
E	0(2.9)

Q851

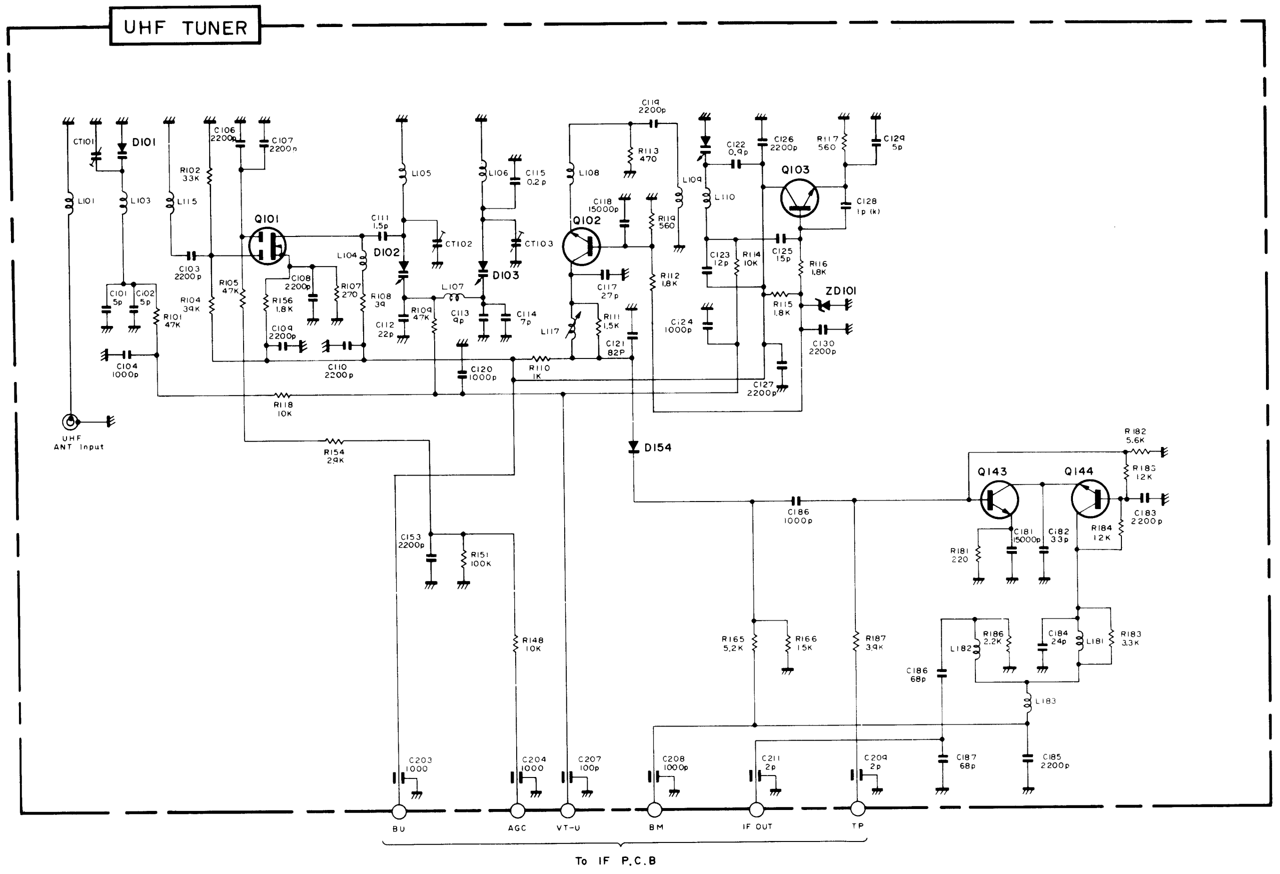
B	0(5.9)
C	0(3.4)
E	0(6.5)

Q853

B	0(2.7)
C	0(9.0)
E	0(2.0)

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN( ) ARE MEASURED IN RECORD MODE.

TUNER PACK [For UK model]


UHF TUNER
UHF ANT Input
CT101
D101
L101
L103
L115
C101 5p
C102 5p
R101 47K
C104 1000p
R102 33K
C106 2200p
C107 2200p
C103 2200p
R104 39K
R105 47K
Q101
R156 1.8K
C108 2200p
C109 2200p
R107 270
L104
R108 39
C110 2200p
C111 1.5p
D102
L105
CT102
C112 22p
R109 47K
L107
C113 9p
C114 7p
L106
C115 0.2p
CT103
D103
C120 1000p
R110 1K
R118 10K
R154 29K
L108
C118 15000p
Q102
C119 2200p
R113 470
R119 560
C117 27p
L117
R111 1.5K
C121 82P
R112 1.8K
L109
L110
C122 0.9p
C126 2200p
Q103
R117 560
C129 5p
C128 1p (k)
C123 12p
R114 10K
C125 15p
R116 1.8K
C124 1000p
R115 1.8K
ZD101
C130 2200p
C127 2200p
D154
C153 2200p
R151 100K
R148 10K
C186 1000p
Q143
Q144
R182 5.6K
R183 12K
C183 2200p
R181 220
C181 15000p
C182 33p
R184 12K
R165 5.2K
R166 15K
R187 3.9K
L182
R186 2.2K
C184 24p
L181
R183 3.3K
C186 68p
L183
C203 1000
C204 1000
C207 100p
C208 1000p
C211 2p
C209 2p
C187 68p
C185 2200p
BU
AGC
VT-U
BM
IF OUT
TP
To IF P.C.B

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RECTIFIER	139/139
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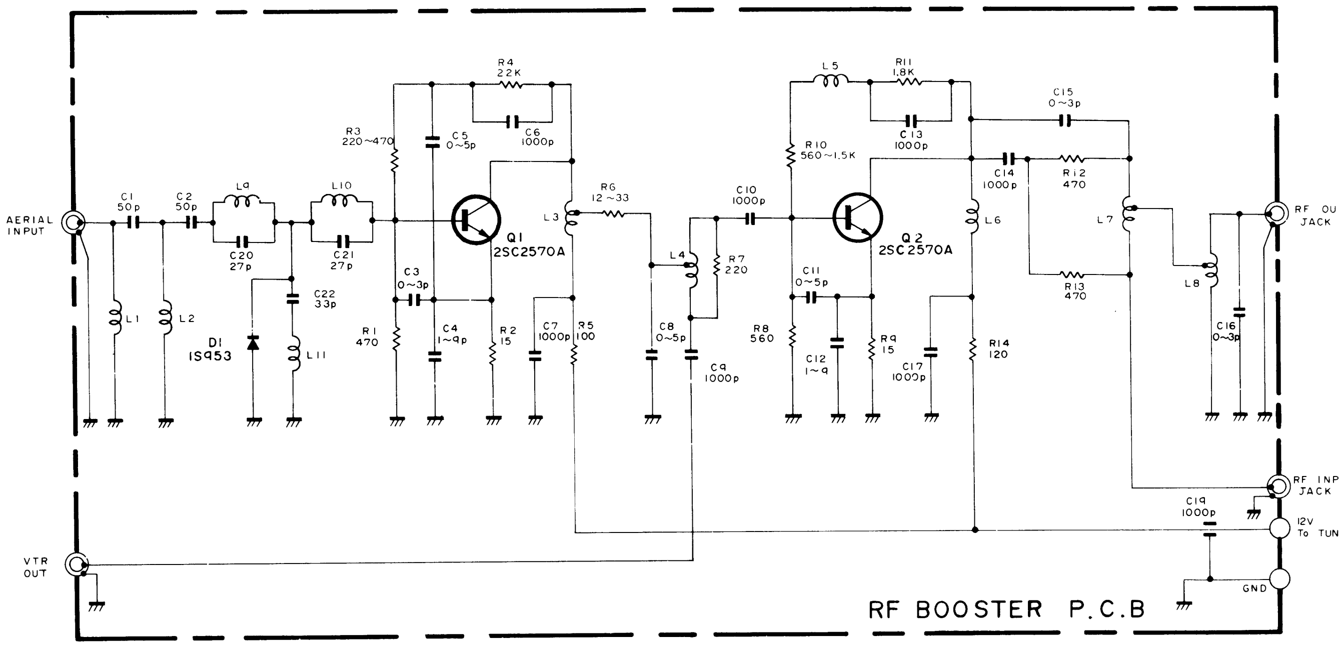
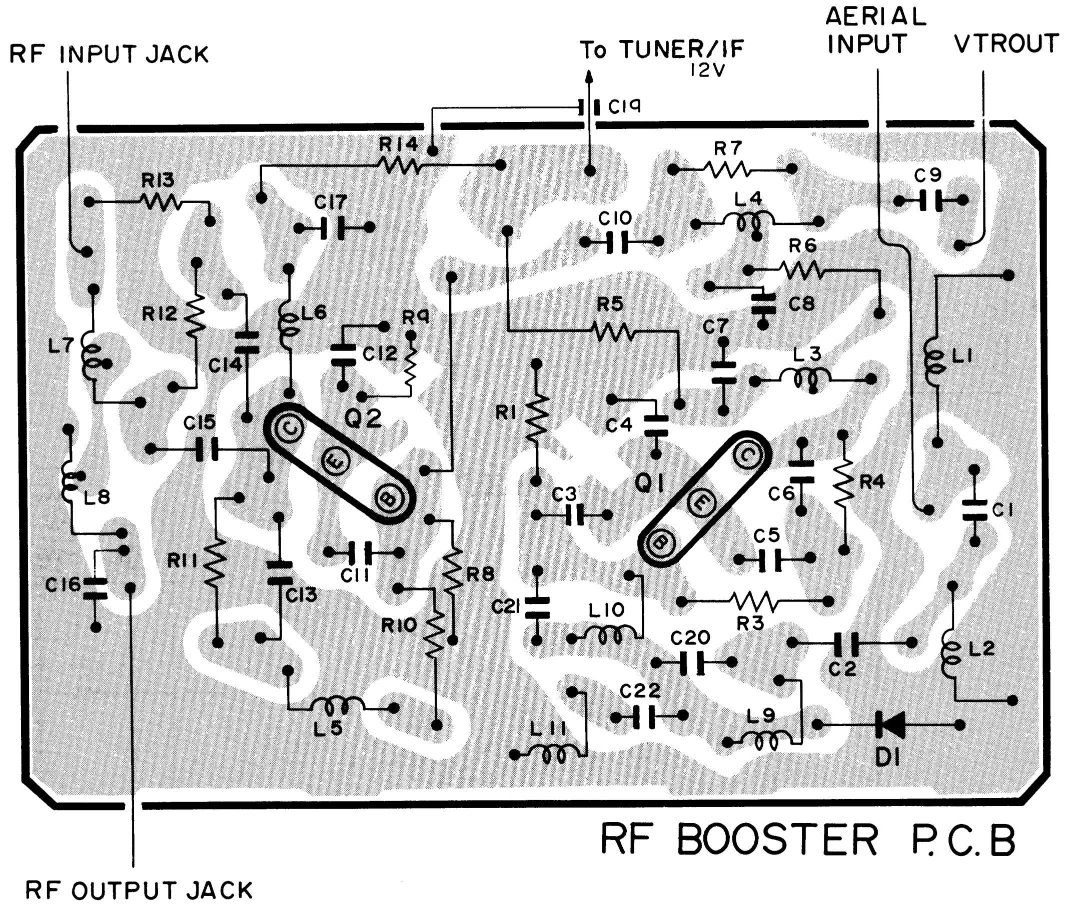
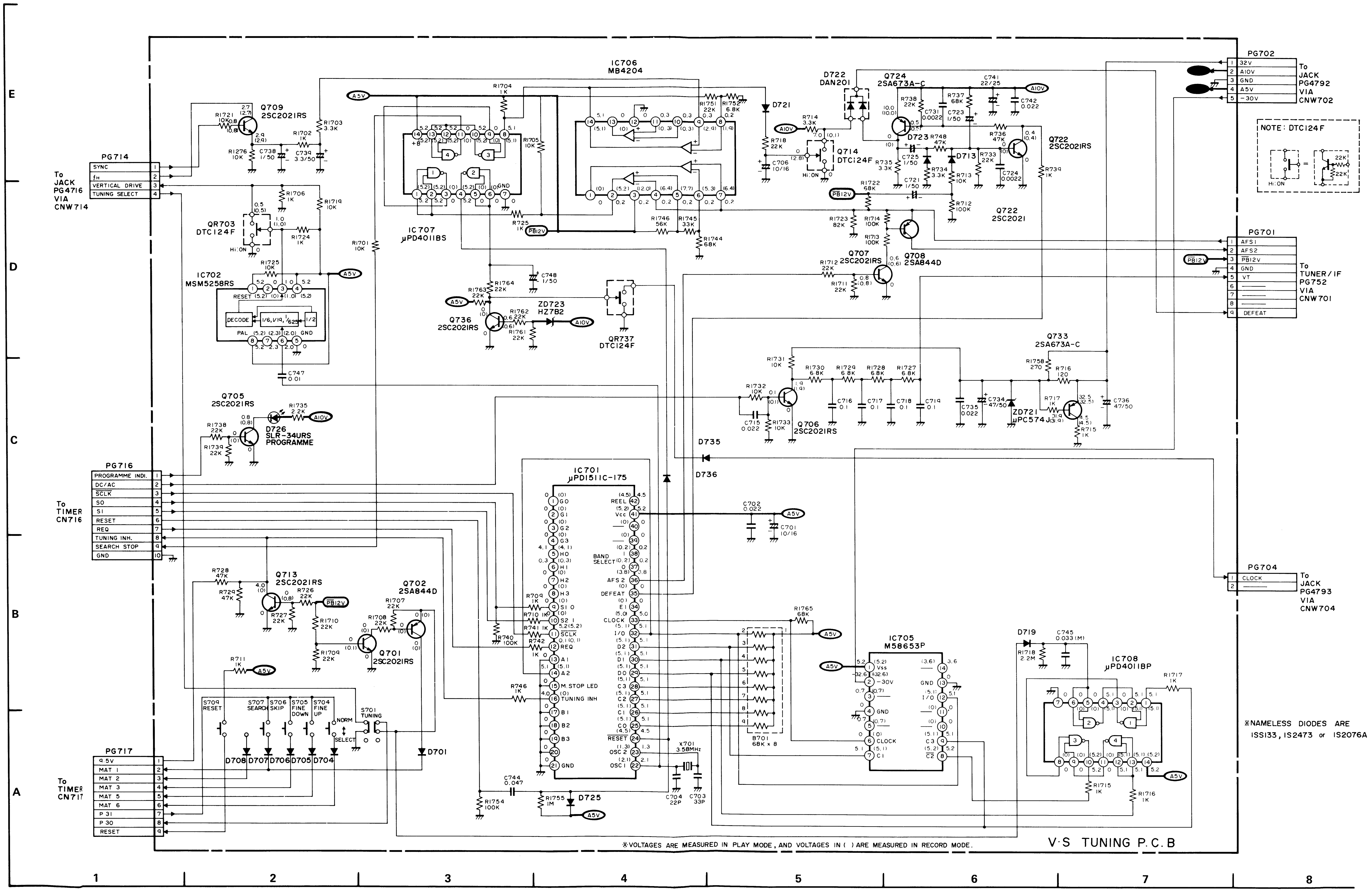
RF BOOSTER [For UK model]


AERIAL INPUT
C1 50p
C2 50p
L1
L2
L9
C20 27p
L10
C21 27p
D1 1S953
C22 33p
L11
R3 220~470
C5 0~5p
R4 22K
C6 1000p
C3 0~3p
R1 470
C4 1~9p
Q1 2SC2570A
R2 15
C7 1000p
R5 100
L3
R6 12~33
L4
R7 220
C8 0~5p
C9 1000p
C10 1000p
L5
R11 1.8K
C13 1000p
R10 560~1.5K
Q2 2SC2570A
C11 0~5p
R8 560
C12 1~9
R9 15
C17 1000p
L6
R14 120
C15 0~3p
C14 1000p
R12 470
R13 470
L7
L8
C16 0~3p
RF OU JACK
RF INPUT JACK
C19 1000p
12V To TUNER/IF
GND
VTR OUT
RF BOOSTER P.C.B


RF INPUT JACK
To TUNER/IF 12V
AERIAL INPUT
VTROUT
C19
R14
R13
C17
R7
C9
L4
C10
R6
C8
R12
L6
R9
R5
C7
L7
C14
C12
L3
L1
R1
C15
Q2
C4
R4
C6
Q1
L8
C3
C1
R11
C11
R8
C5
C16
C13
C21
L10
R3
R10
C20
C2
L2
C22
L9
L5
L11
D1
RF OUTPUT JACK
RF BOOSTER P.C.B

E
D
C
B
A

V·S TUNING [For UK model]



E
D
C
B
A
1
2
3
4
5
6
7
8
IC706 MB4204
IC707 µPD4011BS
IC702 MSM5258RS
DECODE
1/6, 1/19, 1/625
1/2
IC701 µPD1511C-175
IC705 M58653P
IC708 µPD4011BP
Q709 2SC2021RS
Q724 2SA673A-C
Q722 2SC2021RS
Q714 DTC124F
Q722 2SC2021
Q707 2SC2021RS
Q708 2SA844D
QR703 DTC124F
Q736 2SC2021RS
QR737 DTC124F
ZD723 HZ7B2
Q733 2SA673A-C
ZD721 µPC574J
Q706 2SC2021RS
Q705 2SC2021RS
D726 SLR-34URS PROGRAMME
Q713 2SC2021RS
Q702 2SA844D
Q701 2SC2021RS
D722 DAN201
D721
D723
D713
D735
D736
D719
D725
D701
D708 D707 D706 D705 D704
B701 68K × 8
X701 3.58MHz
S709 RESET
S707 SEARCH
S706 SKIP
S705 FINE DOWN
S704 FINE UP
S701 TUNING
NORM
SELECT
PG714
SYNC
fH
VERTICAL DRIVE
TUNING SELECT
To JACK PG4716 VIA CNW714
PG716
PROGRAMME INDI.
DC/AC
SCLK
SO
SI
RESET
REQ
TUNING INH.
SEARCH STOP
GND
To TIMER CN716
PG717
9.5V
MAT 1
MAT 2
MAT 3
MAT 5
MAT 6
P 31
P 30
RESET
To TIMER CN717
PG702
32V
A10V
GND
A5V
-30V
To JACK PG4792 VIA CNW702
PG701
AFS1
AFS2
PB12V
GND
VT
DEFEAT
To TUNER/IF PG752 VIA CNW701
PG704
CLOCK
To JACK PG4793 VIA CNW704
NOTE: DTC124F
Hi:ON
22K
A5V
A10V
PB12V
V·S TUNING P.C.B

※VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

※NAMELESS DIODES ARE ISS133, IS2473 or IS2076A

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TIMER 135/135
RECTIFIER 139/139
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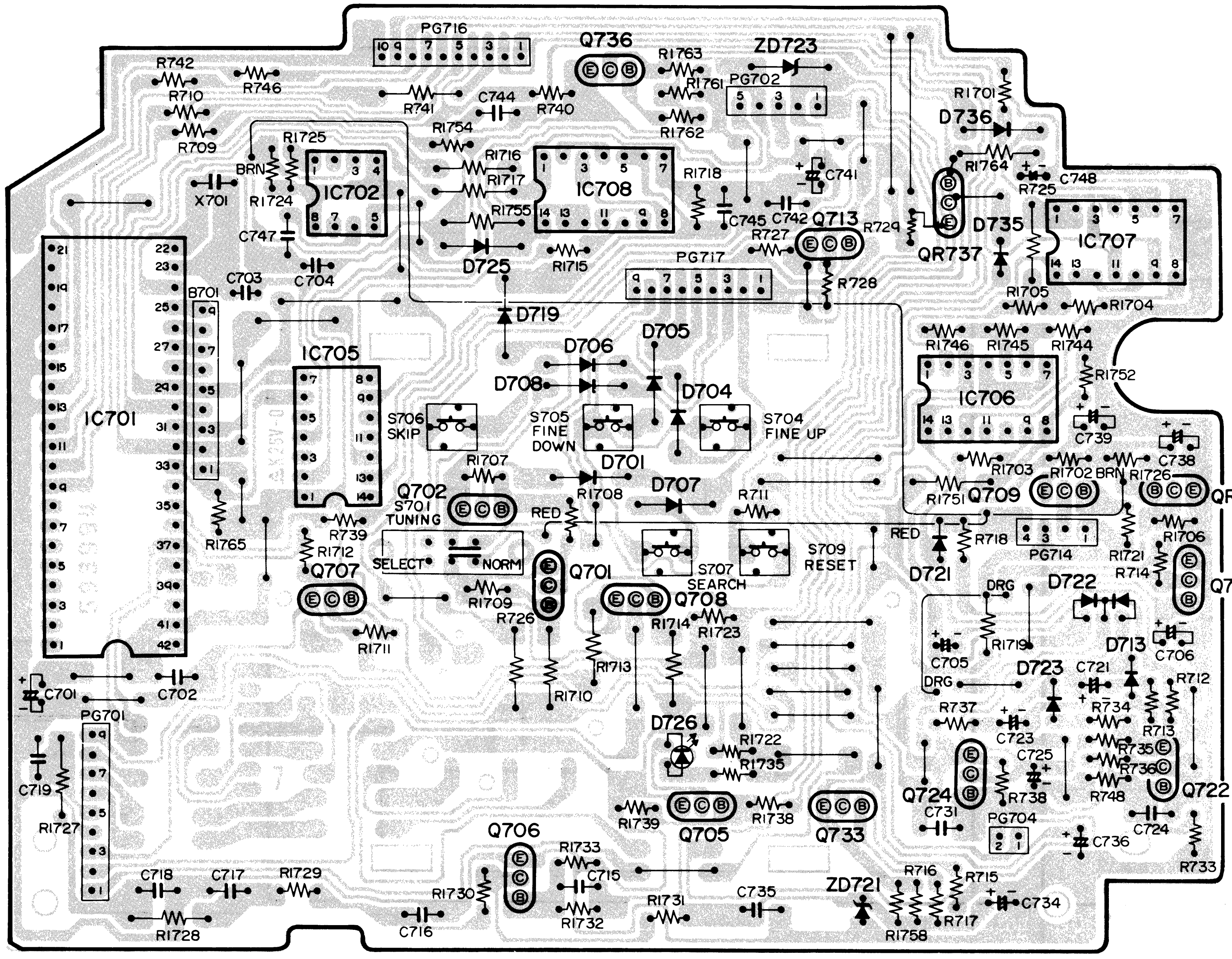


PG716
Q736
ZD723
R1763
R1761
PG702
R742
R746
R710
R709
R741
C744
R740
R1754
R1762
R1701
D736
R1725
BRN
IC702
X701
R1724
C747
R1716
R1717
IC708
R1755
R1718
C741
R1764
R725
C748
C745
C742
Q713
R1727
R729
D735
QR737
IC707
D725
R1715
PG717
R728
C703
C704
B701
R1705
R1704
IC701
D719
R1746
R1745
R1744
D706
D705
IC705
D708
D704
IC706
R1752
S706 SKIP
S705 FINE DOWN
S704 FINE UP
C739
C738
D701
R1707
R1703
R1702
BRN
R1726
Q702
R1708
D707
R711
R1751
Q709
QR703
S701 TUNING
R739
R1712
RED
R1765
SELECT
NORM
RED
R718
PG714
R1721
R1706
Q707
Q701
S707 SEARCH
S709 RESET
D721
R714
Q714
R1709
R726
Q708
DRG
D722
R1714
R1723
R1719
D713
C706
R1711
R1713
C705
D723
C721
R712
C701
C702
R1710
DRG
R737
R734
R713
PG701
D726
R1722
C723
C725
R735
R736
C719
R1735
Q724
R738
Q722
R1727
R1739
Q705
R1738
Q733
C731
PG704
R748
C724
C736
Q706
R1733
R733
C718
C717
R1729
C715
ZD721
R716
R715
C734
R1730
R1731
C735
R1728
C716
R1732
R1758
R717

V.S TUNING P.C.B

IC701

21	0 (0)	22	2.1 (2.1)
20	0 (0)	23	1.3 (1.3)
19	0 (0)	24	4.5 (4.5)
18	0 (0)	25	5.1 (5.1)
17	0 (0)	26	5.1 (5.1)
16	4.0 (0)	27	5.1 (5.1)
15	0 (0)	28	5.1 (5.1)
14	5.1 (5.1)	29	5.1 (5.1)
13	0 (0)	30	5.1 (5.1)
12	0.1 (0.1)	31	5.1 (5.1)
11	5.2 (5.2)	32	5.1 (5.1)
10	0 (0)	33	5.0 (5.0)
9	0 (0)	34	0 (0)
8	0 (0)	35	0 (0)
7	0 (0)	36	3.8 (3.8)
6	0.3 (0.3)	37	0.2 (0.2)
5	4.1 (4.1)	38	0.2 (0.2)
4	0 (0)	39	0 (0)
3	0 (0)	40	0 (0)
2	0 (0)	41	5.2 (5.2)
1	0 (0)	42	4.5 (4.5)

IC702

1	2	3	4
5.2 (5.2)	0 (0)	1.0 (1.0)	5.2 (5.2)
8	7	6	5
5.2 (5.2)	2.3 (2.3)	2.0 (2.0)	0 (0)

IC705

7	5.1 (5.1)	8	5.2 (5.2)
6	0 (0)	9	5.1 (5.1)
5	0.7 (0.7)	10	0 (0)
4	0 (0)	11	0 (0)
3	0.7 (0.7)	12	5.1 (5.1)
2	-32.6 (-32.6)	13	0 (0)
1	5.2 (5.2)	14	3.6 (3.6)

IC706

1	2	3	4	5	6	7
0 (0)	0.2 (5.2)	0.2 (12.0)	0.2 (6.4)	0.2 (7.7)	0.2 (5.3)	0.2 (6.4)
14	13	12	11	10	9	8
5.1 (5.1)	0 (0)	0 (0)	0.3 (0.3)	0.3 (0.3)	0.3 (2.9)	0.2 (1.9)

IC707

1	2	3	4	5	6	7
5.2 (5.2)	5.2 (5.2)	0 (0)	5.2 (5.2)	0 (0)	0 (0)	0 (0)
14	13	12	11	10	9	8
5.2 (5.2)	5.2 (5.2)	5.2 (5.2)	0 (0)	5.2 (5.2)	0 (0)	5.1 (5.1)

IC708

1	2	3	4	5	6	7
5.1 (5.1)	5.1 (5.1)	0 (0)	5.1 (5.1)	0 (0)	0 (0)	0 (0)
14	13	12	11	10	9	8
5.2 (5.2)	5.1 (5.1)	5.1 (5.1)	0 (0)	5.2 (5.2)	0 (0)	0 (0)

PG701

9	DEFEAT
8	———
7	———
6	———
5	VT
4	GND
3	$\overline{\text{PB}}$12V
2	AFS 2
1	AFS 1

To
TUNER/IF
PG752
VIA
CNW701

PG702

1	32V
2	A10V
3	GND
4	A5V
5	−30V

To
JACK
PG4792
VIA
CNW702

PG704

1	CLOCK
2	———

To
JACK
PG4793
VIA
CNW704

PG714

1	SYNC
2	f_H
3	VERTICAL DRIVE
4	TUNING SELECT

To
JACK
PG4716
VIA
CNW714

PG716

1	PROGRAMME INDI.
2	DC/AC
3	$\overline{\text{SCLK}}$
4	SO
5	SI
6	RESET
7	REQ
8	TUNING INH.
9	SEARCH STOP
10	GND

To
TIMER
CN716

PG717

1	9.5V
2	MAT 1
3	MAT 2
4	MAT 3
5	MAT 5
6	MAT 6
7	P31
8	P30
9	RESET

To
TIMER
CN717

Q701

B	0 (0.1)
C	0 (0)
E	0 (0)

Q702

B	0 (0)
C	0 (0)
E	0 (0)

QR703

B	1.0 (1.0)
C	0.5 (0.5)
E	0 (0)

Q705

B	0 (0)
C	0.8 (0.8)
E	0 (0)

Q706

B	0.1 (0.1)
C	1.9 (1.9)
E	0 (0)

Q707

B	0.8 (0.8)
C	0.6 (0.6)
E	0 (0)

Q708

B	0.5 (0.5)
C	0.1 (0.1)
E	0.6 (0.6)

Q709

B	0.8 (0.8)
C	2.7 (2.7)
E	2.9 (2.9)

Q713

B	0 (0.8)
C	4.0 (0)
E	0 (0)

Q714

B	0 (2.8)
C	7.0 (0.1)
E	0 (0)

Q722

B	0 (0)
C	0.4 (0.4)
E	0 (0)

Q724

B	0.5 (0.5)
C	0 (0)
E	10.0 (10.0)

Q733

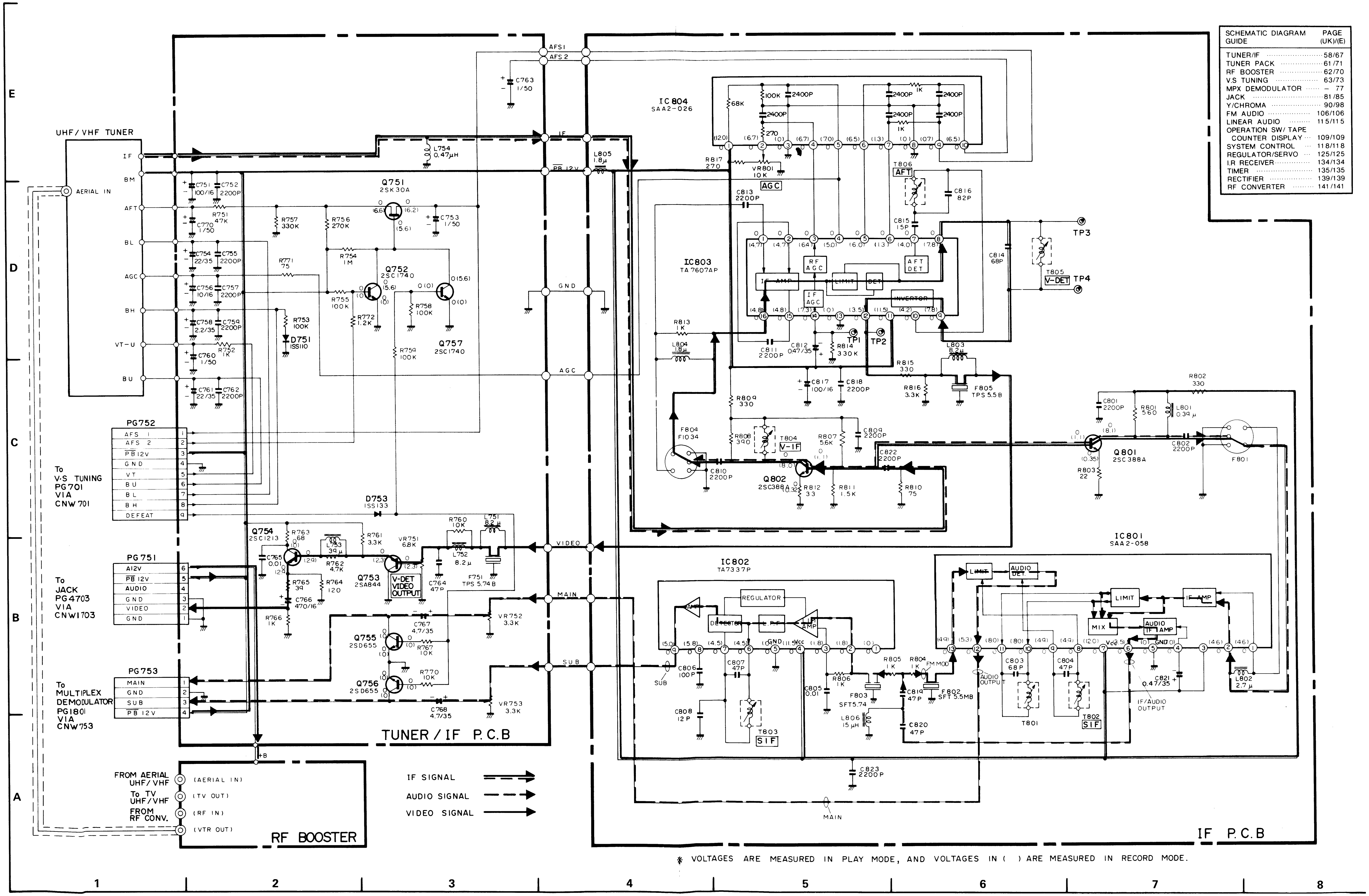
B	31.9 (31.9)
C	4.5 (4.5)
E	32.5 (32.5)

Q736

B	0.6 (0.6)
C	0 (0)
E	0 (0)

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

TUNER/IF [Except for UK model]


E
D
C
B
A
1
2
3
4
5
6
7
8
UHF/VHF TUNER
IF
BM
AERIAL IN
AFT
BL
AGC
BH
VT-U
BU
C751 100/16
C752 2200P
R751 47K
C770 1/50
C754 22/35
C755 2200P
C756 10/16
C757 2200P
C758 2.2/35
C759 2200P
R752 1K
C760 1/50
C761 22/35
C762 2200P
PG752
AFS 1
AFS 2
PB 12V
GND
VT
BU
BL
BH
DEFEAT
To V-S TUNING PG701 VIA CNW701
PG751
A12V
PB 12V
AUDIO
GND
VIDEO
GND
To JACK PG4703 VIA CNW1703
PG753
MAIN
GND
SUB
PB 12V
To MULTIPLEX DEMODULATOR PG1801 VIA CNW753
FROM AERIAL UHF/VHF
(AERIAL IN)
To TV UHF/VHF
(TV OUT)
FROM RF CONV.
(RF IN)
(VTR OUT)
RF BOOSTER
+B
AFS1
AFS2
C763 1/50
IF
L754 0.47μH
PB 12V
L805 1.8μ
Q751 2SK30A
R757 330K
R756 270K
C753 1/50
R754 1M
Q752 2SC1740
R771 75
R755 100K
R772 1.2K
R758 100K
Q757 2SC1740
R753 100K
D751 1SS110
R759 100K
GND
AGC
D753 1SS133
Q754 2SC1213
R763 68
C765 0.01
L753 39μ
R761 3.3K
VR751 6.8K
R760 10K
L751 8.2μ
L752 8.2μ
R762 4.7K
Q753 2SA844
V-DET VIDEO OUTPUT
C764 47P
F751 TPS 5.74B
R765 39
R764 120
C766 470/16
R766 1K
VIDEO
MAIN
SUB
VR752 3.3K
Q755 2SD655
C767 4.7/35
R767 10K
Q756 2SD655
R770 10K
C768 4.7/35
VR753 3.3K
TUNER / IF P.C.B
IF SIGNAL
AUDIO SIGNAL
VIDEO SIGNAL
IC804 SAA2-026
68K
100K
2400P
270
1K
R817 270
VR801 10K
AGC
T806
AFT
C816 82P
C813 2200P
C815 15P
IC803 TA7607AP
IF AMP
RF AGC
LIMIT
DET
AFT DET
IF AGC
INVERTER
C814 68P
TP3
T805
V-DET
TP4
R813 1K
L804 1.8μ
C811 2200P
C812 047/35
R814 330K
TP1
TP2
R815 330
L803 8.2μ
C817 100/16
C818 2200P
R816 3.3K
F805 TPS 5.5B
R809 330
R808 390
T804
V-IF
R807 5.6K
C809 2200P
F804 F1034
C810 2200P
Q802 2SC388A
R812 33
R811 1.5K
C822 2200P
R810 75
R802 330
C801 2200P
R801 560
L801 0.39μ
Q801 2SC388A
C802 2200P
F801
R803 22
IC801 SAA2-058
IC802 TA7337P
REGULATOR
AMP
DETECTOR
L.P.F
LIMIT
AUDIO DET
IF AMP
MIX
AUDIO IF AMP
GND
Vcc
SUB
C806 100P
C807 47P
C808 12P
T803
SIF
C805 0.01
R806 1K
F803 SFT5.74
L806 15μH
R805 1K
R804 1K
FM MOD
C819 47P
F802 SFT 5.5MB
C820 47P
AUDIO OUTPUT
C803 68P
T801
C804 47P
T802
SIF
C821 0.47/35
IF/AUDIO OUTPUT
L802 2.7μ
C823 2200P
MAIN
IF P.C.B

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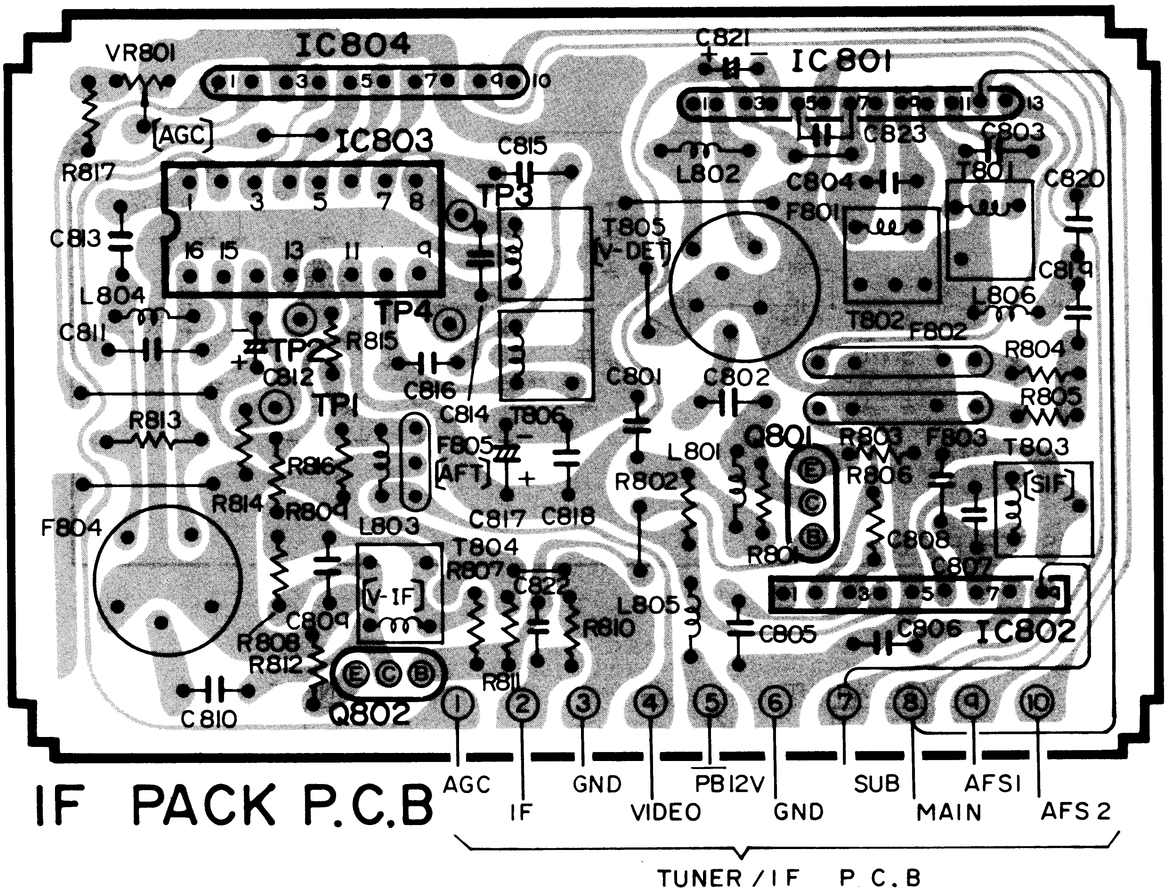
MPX DEMODULATOR	— 77
JACK	81/85
Y/CHROMA	90/98
FM AUDIO	106/106
LINEAR AUDIO	115/115
OPERATION SW/ TAPE COUNTER DISPLAY	109/109
SYSTEM CONTROL	118/118
REGULATOR/SERVO	125/125
I.R RECEIVER	134/134
TIMER	135/135
RECTIFIER	139/139
RF CONVERTER	141/141

* VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

IF [Except for UK model]


VR801
IC804
C821
IC801
AGC
IC803
R817
C815
C803
C820
L802
C804
C823
T801
C813
TP3
T805
V-DET
F801
C819
L804
TP4
L806
C811
TP2
R815
T802
F802
R804
C812
C816
C801
C802
R805
R813
TP1
C814
T806
L801
Q801
R803
F803
T803
F805
AFT
R816
R802
R806
SIF
R814
R809
L803
C817
C818
F804
T804
R801
C808
C807
R807
V-IF
C822
L805
C809
R810
C805
C806
IC802
R808
R812
R811
C810
Q802
E
C
B
1
2
3
4
5
6
7
8
9
10
AGC
IF
GND
VIDEO
PB12V
GND
SUB
MAIN
AFS1
AFS 2
IF PACK P.C.B
TUNER / I F P C.B

IC801

1	2	3	4	5	6	7	8	9	10	11	12	13
0 (4.6)	0 (4.6)		0 (7.0)	0 (0)	0 (3.5)	0 (12.0)	0 (4.9)	0 (4.9)	0 (8.0)	0 (8.0)	0 (5.3)	0 (4.9)

IC802

1	2	3	4	5	6	7	8	9
0 (0)	0 (1.8)	0 (1.8)	0 (11.5)	0 (0)	0 (4.5)	0 (4.5)	0 (5.8)	0 (5.0)

IC804

1	2	3	4	5	6	7	8	9	10
0 (12.0)	0 (6.7)	0 (0)	0 (6.7)	0 (7.0)	0 (6.5)	0 (1.3)	0 (0)	0 (0.7)	0 (6.5)

IC803

1	2	3	4	5	6	7	8
0 (4.7)	0 (4.7)	0 (6.4)	0 (5.0)	0 (6.0)	0 (1. 3)	0 (4.0)	0 (7.8)
16	15	14	13	12	11	10	9
0 (4.8)	0 (4.8)	0 (7.3)	0 (0)	0 (3.5)	0 (11.5)	0 (4.2)	0 (7.8)

Q801

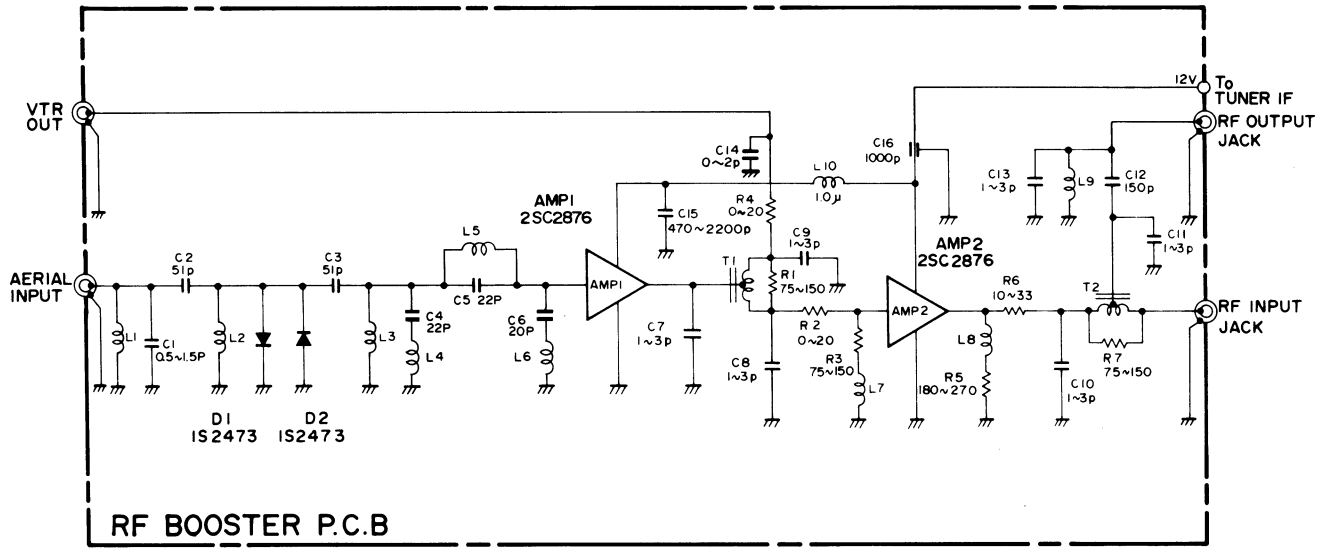
B	0 (1.1)
C	0 (8.1)
E	0 (0.35)

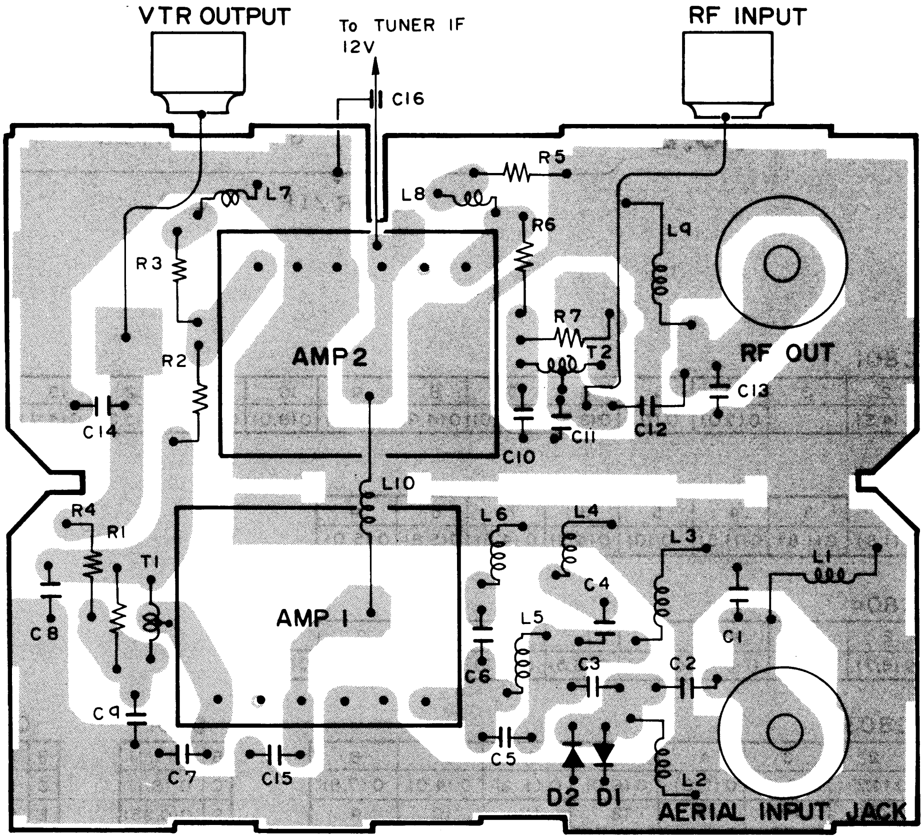
Q802

B	0 (1.1)
C	0 (8.0)
E	0 (0.32)

※VOLTAGES ARE MEASURED IN PLAY MODE,
AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

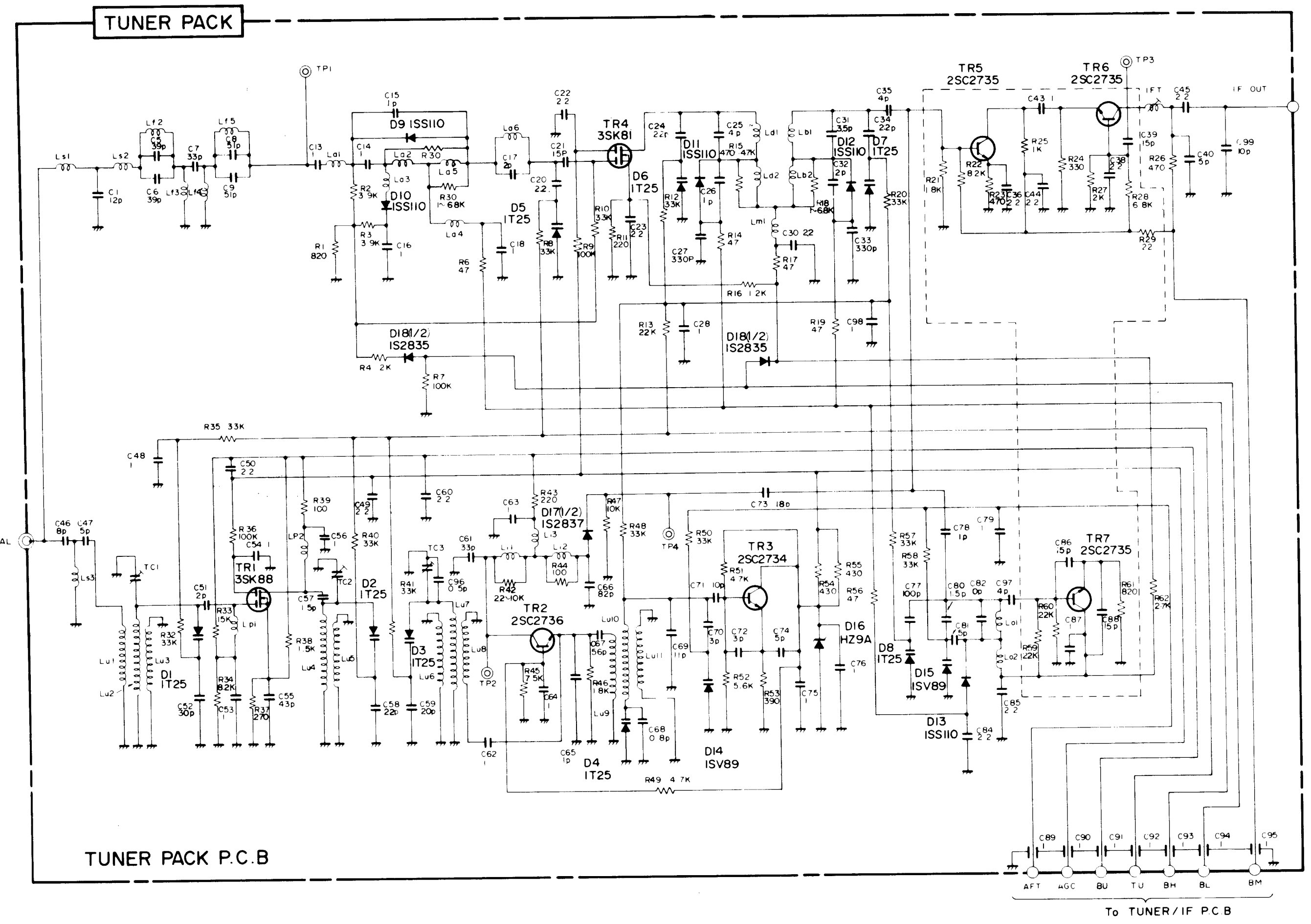
RF BOOSTER [Except for UK model]


VTR OUT
AERIAL INPUT
12V
To TUNER IF
RF OUTPUT JACK
RF INPUT JACK
L1
C1 0.5~1.5P
C2 51p
L2
D1 1S2473
D2 1S2473
C3 51p
L3
C4 22P
L4
L5
C5 22P
C6 20P
L6
AMP1 2SC2876
AMP1
C7 1~3p
C14 0~2p
C15 470~2200p
R4 0~20
T1
R1 75~150
C9 1~3p
C8 1~3p
R2 0~20
R3 75~150
L7
L10 1.0μ
C16 1000p
AMP2 2SC2876
AMP2
R6 10~33
L8
R5 180~270
C13 1~3p
L9
C12 150p
C11 1~3p
T2
R7 75~150
C10 1~3p
RF BOOSTER P.C.B


VTR OUTPUT
To TUNER IF
12V
C16
RF INPUT
R5
L7
L8
R6
R3
AMP 2
R2
L9
R7
T2
RF OUT
C13
C14
C10
C11
C12
L10
R4
R1
T1
C8
AMP 1
L6
L4
L3
L1
C4
L5
C1
C6
C3
C2
C9
C7
C15
C5
D2
D1
L2
AERIAL INPUT JACK

RF BOOSTER P.C.B

TUNER PACK [Except for UK model]


TUNER PACK
TP1
TP3
TR4 3SK81
TR5 2SC2735
TR6 2SC2735
TR1 3SK88
TR2 2SC2736
TR3 2SC2734
TR7 2SC2735
D9 1SS110
D10 1SS110
D11 1SS110
D12 1SS110
D181/2I 1S2835
D171/2I 1S2837
D16 HZ9A
D13 1SS110
D14 ISV89
D15 ISV89
IF OUT
AERIAL
TUNER PACK P.C.B
AFT
AGC
BU
TU
BH
BL
BM
To TUNER/IF P.C.B

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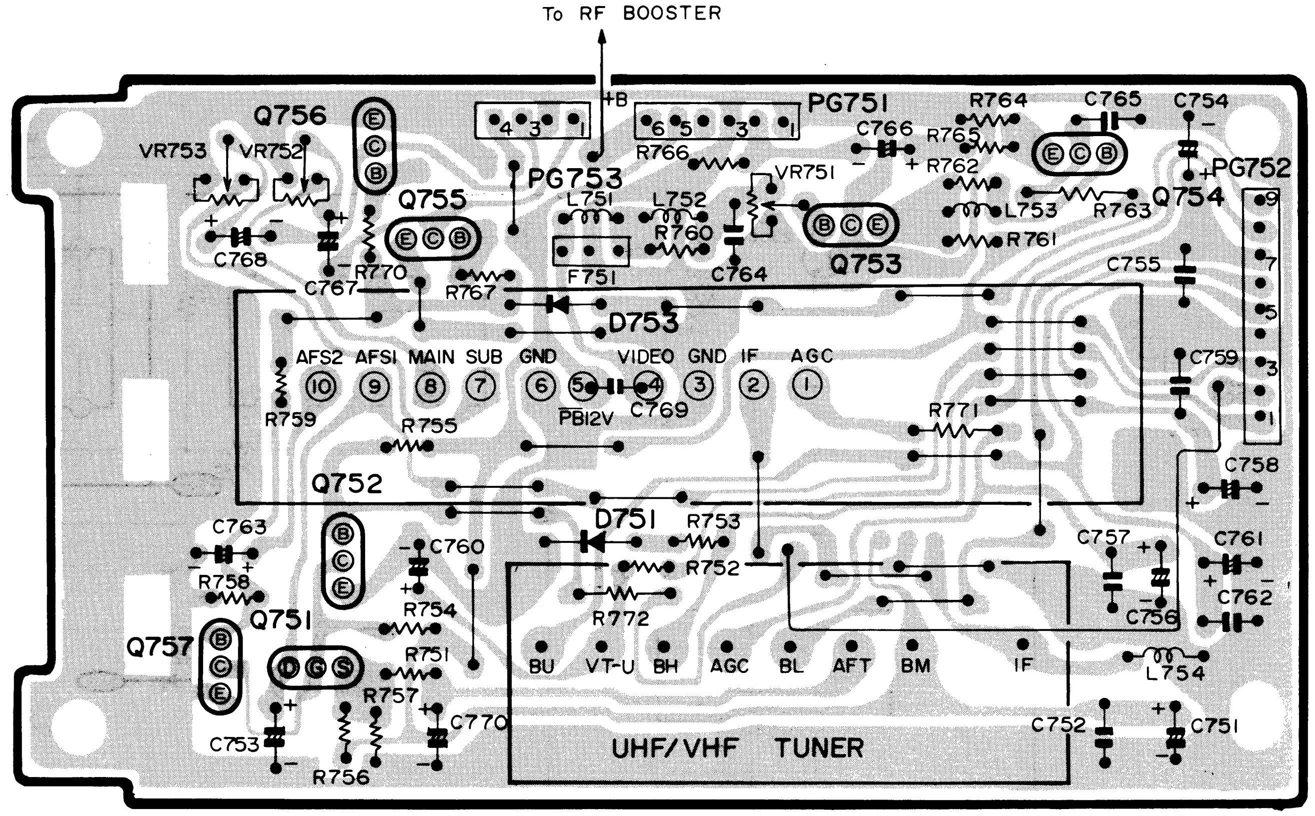
Y/CHROMA	90/98
FM AUDIO	106/106
LINEAR AUDIO	115/115
OPERATION SW/ TAPE COUNTER DISPLAY	109/109
SYSTEM CONTROL	118/118
REGULATOR/SERVO	125/125
I.R RECEIVER	134/134
TIMER	135/135
RECTIFIER	139/139
RF CONVERTER	141/141

TUNER IF [Except for UK model]


To RF BOOSTER
+B
Q756
VR753
VR752
PG753
PG751
R764
C765
C754
C766
R765
R766
R762
VR751
PG752
Q754
Q755
L751
L752
L753
R763
R760
R761
C768
C767
R770
R767
F751
C764
Q753
C755
D753
AFS2
AFS1
MAIN
SUB
GND
VIDEO
GND
IF
AGC
C759
R759
R755
PB12V
C769
R771
Q752
C758
D751
R753
C763
C760
C757
C761
R758
R752
C762
C756
Q751
R754
Q757
R772
R751
BU
VT-U
BH
AGC
BL
AFT
BM
IF
L754
R757
C770
C753
C752
C751
R756
UHF/VHF TUNER

TUNER/IF P.C.B

Q751

D	0(6.2)
G	0(5.6)
S	0(6.6)

Q752

B	0(0)
C	0(5.6)
E	0(0)

Q753

B	0(2.3)
C	0(10.1)
E	0(2.3)

Q754

B	0(2.9)
C	0(0)
E	0(2.9)

Q755

B	0(0)
C	0(0)
E	0(0)

Q756

B	0(0)
C	0(0)
E	0(0)

Q757

B	0(0)
C	0(5.6)
E	0(0)

※VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

PG751

1	GND
2	VIDEO
3	GND
4	AUDIO
5	$\overline{\text{PB}}$ 12V
6	A12V

To
JACK
PG4703
VIA
CNW1703

PG752

9	DEFEAT
8	BH
7	BL
6	BU
5	VT
4	GND
3	$\overline{\text{PB}}$ 12V
2	AFS 2
1	AFS 1

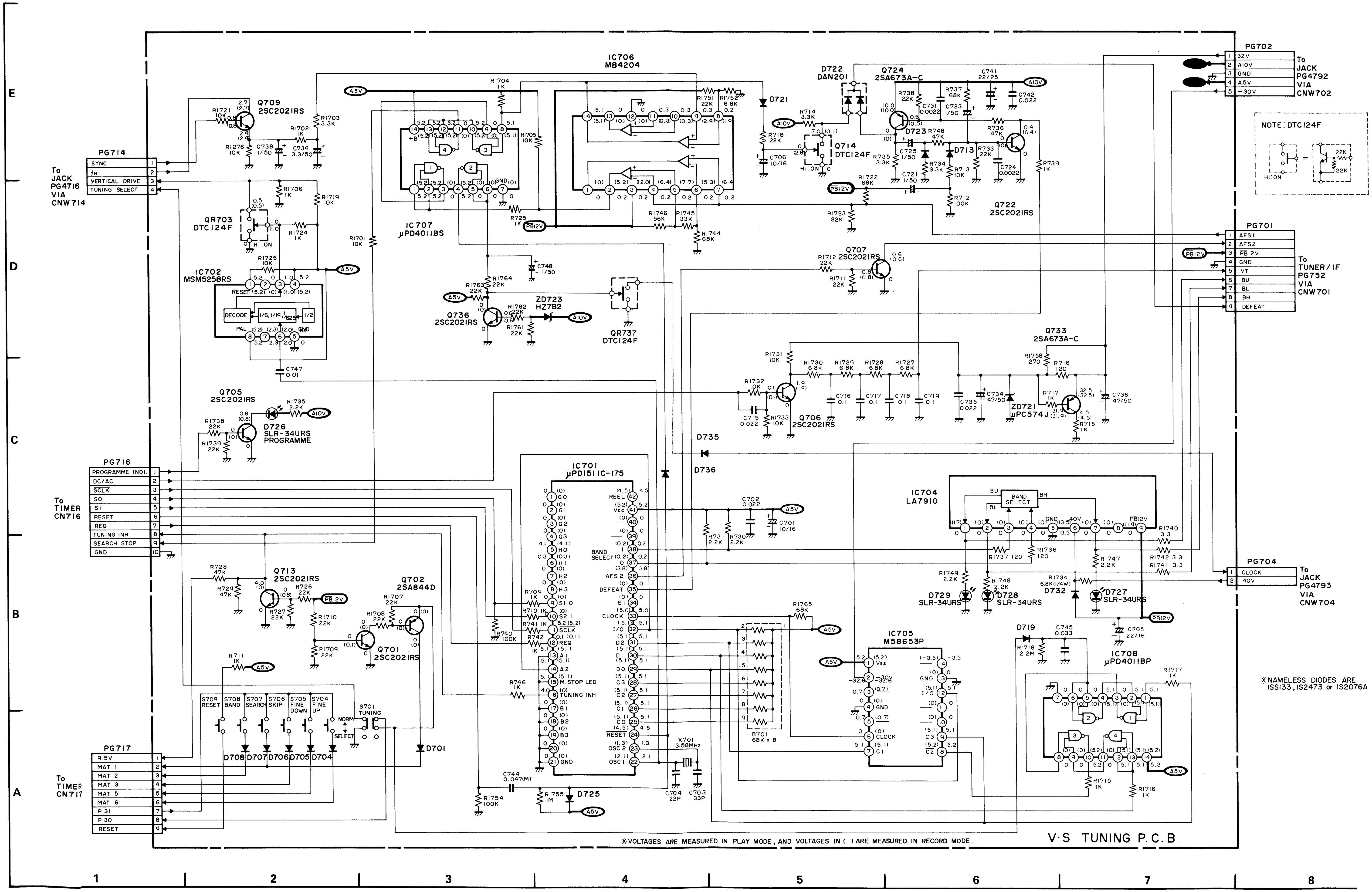
To
V.S TUNING
PG701
VIA
CNW701

PG753

1	MAIN
2	GND
3	SUB
4	$\overline{\text{PB}}$ 12V

To
MULTIPLEX DEMODULATOR
PG1801
VIA
CNW753

V·S TUNING [Except for UK model]


IC706 MB4204
IC707 µPD4011BS
IC702 MSM5258RS
DECODE
1/6,1/19,1/625
1/2
RESET
PAL
GND
IC701 µPD1511C-175
REEL
Vcc
BAND SELECT
AFS 2
DEFEAT
CLOCK
I/O
RESET
OSC 2
OSC 1
G0
G1
G2
G3
H0
H1
H2
H3
SI 0
S2 1
SCLK
REQ
A1
A2
M.STOP LED
TUNING INH
B1
B2
B3
GND
IC704 LA7910
BAND SELECT
BU
BL
BH
IC705 M58653P
Vss
GND
CLOCK
C1
C3
I/O
IC708 µPD4011BP
Q709 2SC2021RS
QR703 DTC124F
HI:ON
Q736 2SC2021RS
ZD723 HZ7B2
QR737 DTC124F
Q705 2SC2021RS
D726 SLR-34URS PROGRAMME
Q713 2SC2021RS
Q702 2SA844D
Q701 2SC2021RS
D722 DAN201
Q724 2SA673A-C
Q714 DTC124F
Q722 2SC2021RS
Q707 2SC2021RS
Q733 2SA673A-C
Q706 2SC2021RS
ZD721 µPC574J
D721
D723
D713
D735
D736
D729 SLR-34URS
D728 SLR-34URS
D727 SLR-34URS
D732
D719
D725
D701
D708
D707
D706
D705
D704
X701 3.58MHz
B701 68K × 8
S709 RESET
S708 BAND
S707 SEARCH
S706 SKIP
S705 FINE DOWN
S704 FINE UP
S701 TUNING
NORM
SELECT
A5V
A10V
PB12V
NOTE: DTC124F
HI:ON
22K
22K
PG714
1 SYNC
2 fH
3 VERTICAL DRIVE
4 TUNING SELECT
To JACK PG4716 VIA CNW714
PG716
1 PROGRAMME INDI.
2 DC/AC
3 SCLK
4 SO
5 SI
6 RESET
7 REQ
8 TUNING INH
9 SEARCH STOP
10 GND
To TIMER CN716
PG717
1 9.5V
2 MAT 1
3 MAT 2
4 MAT 3
5 MAT 5
6 MAT 6
7 P 31
8 P 30
9 RESET
To TIMER CN717
PG702
1 32V
2 A10V
3 GND
4 A5V
5 -30V
To JACK PG4792 VIA CNW702
PG701
1 AFS1
2 AFS2
3 PB12V
4 GND
5 VT
6 BU
7 BL
8 BH
9 DEFEAT
To TUNER/IF PG752 VIA CNW701
PG704
1 CLOCK
2 40V
To JACK PG4793 VIA CNW704
1
2
3
4
5
6
7
8
A
B
C
D
E

※VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

V·S TUNING P.C.B

※NAMELESS DIODES ARE 1SS133, 1S2473 or 1S2076A

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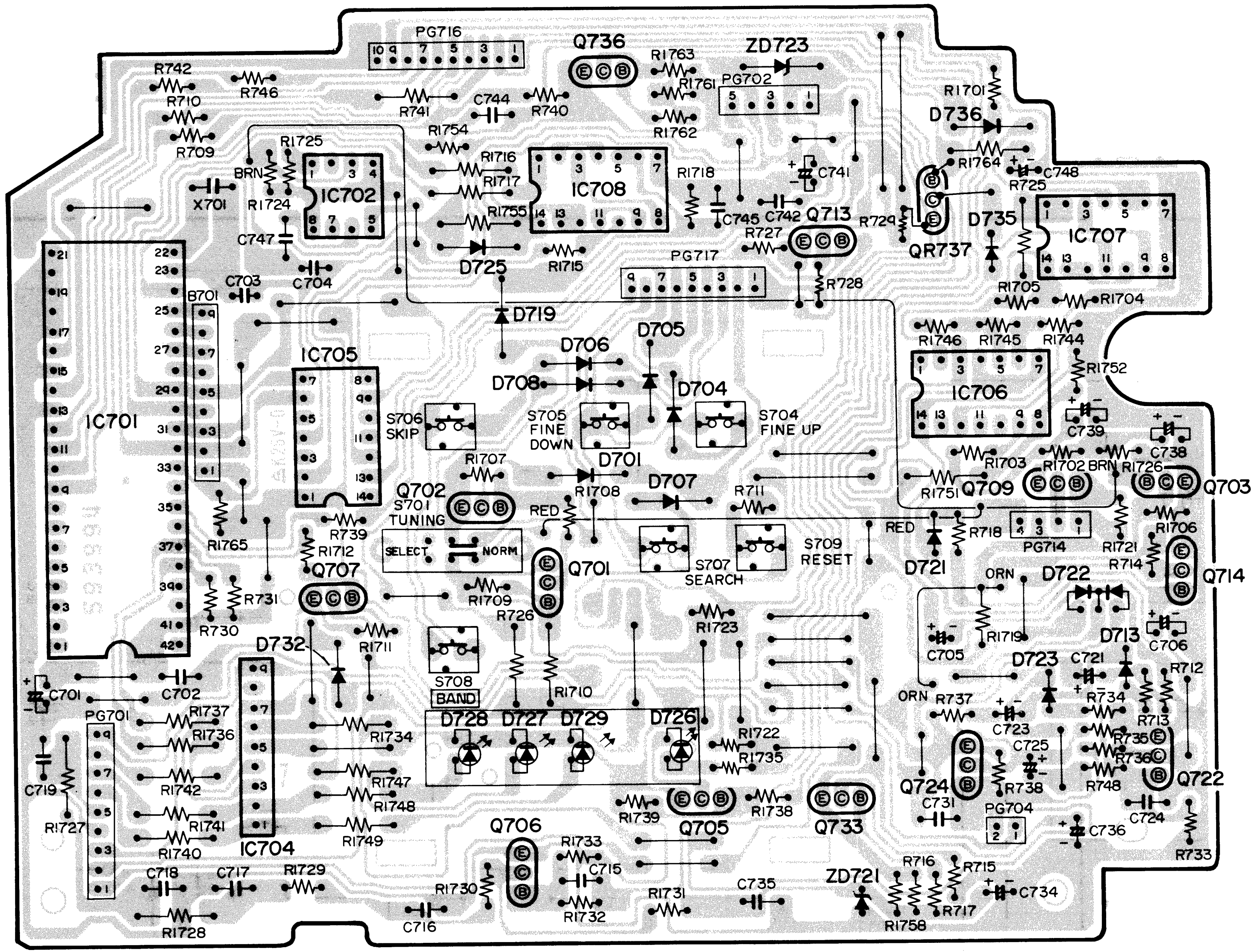
TUNER/IF	58/67
TUNER PACK	61/71
RF BOOSTER	62/70
V.S TUNING	63/73
MPX DEMODULATOR	– 77
JACK	81/85
Y/CHROMA	90/98
FM AUDIO	106/106
LINEAR AUDIO	115/115
OPERATION SW/ TAPE COUNTER DISPLAY	109/109
SYSTEM CONTROL	118/118
REGULATOR/SERVO	125/125
I.R RECEIVER	134/134
TIMER	135/135
RECTIFIER	139/139
RF CONVERTER	141/141


PG716
Q736
ZD723
R1763
R1761
PG702
R742
R710
R746
R741
C744
R740
R1754
R1762
R1701
D736
R709
R1725
R1716
R1717
IC708
R1718
C741
R1764
C748
R725
BRN
IC702
X701
R1724
R1755
C745
C742
Q713
R729
D735
IC707
C747
R727
QR737
D725
R1715
PG717
R728
R1705
R1704
IC701
B701
C703
C704
D719
R1746
R1745
R1744
IC705
D706
D705
R1752
D708
D704
IC706
S706 SKIP
S705 FINE DOWN
S704 FINE UP
C739
C738
D701
R1707
R1703
R1702
R1726
R1708
D707
R1751
Q709
Q703
Q702
S701 TUNING
R711
RED
R1765
R739
R718
PG714
R1706
R1712
SELECT
NORM
R1721
Q701
S707 SEARCH
S709 RESET
D721
R714
Q714
Q707
R1709
ORN
D722
R731
R730
R726
R1723
R1719
C705
D713
C706
D732
R1711
D723
C721
R712
C701
S708 BAND
R1710
C702
PG701
R1737
R1736
R1734
D728
D727
D729
D726
R737
R734
C723
R713
R735
C725
R736
R1722
R1735
Q722
C719
R1742
R1747
R1748
Q724
R738
R748
R1727
R1741
R1740
IC704
R1749
R1739
Q705
R1738
Q733
C731
PG704
C724
C736
R733
Q706
R1733
C715
C718
C717
R1729
R1730
ZD721
R716
R715
C735
C734
R1731
R1728
C716
R1732
R1758
R717

V.S TUNING P.C.B

IC701

21	0 (0)	22	2.1(2.1)
20	0 (0)	23	1.3 (1.3)
19	0 (0)	24	4.5(4.5)
18	0 (0)	25	5.1 (5.1)
17	0 (0)	26	5.1 (5.1)
16	4.0(0)	27	5.1 (5.1)
15	5.1 (5.1)	28	5.1(5.1)
14	5.1 (5.1)	29	5.1(5.1)
13	5.1 (5.1)	30	5.1 (5.1)
12	0.1 (0.1)	31	5.1(5.1)
11	5.2(5.2)	32	5.1(5.1)
10	0 (0)	33	5.0(5.0)
9	0 (0)	34	0 (0)
8	0 (0)	35	0 (0)
7	0 (0)	36	3.8(3.8)
6	0.3(0.3)	37	0.2(0.2)
5	4.1 (4.1)	38	0.2(0.2)
4	0 (0)	39	0 (0)
3	0 (0)	40	0 (0)
2	0 (0)	41	5.2(5.2)
1	0 (0)	42	4.5(4.5)

IC702

1	2	3	4
5.2 (5.2)	0 (0)	1.0 (1.0)	5.2(5.2)
8	7	6	5
5.2(5.2)	2.3(2.3)	2.0 (2.0)	0 (0)

IC704

9	0 (11.9)
8	0 (0)
7	0 (0)
6	13.5(13.5)
5	0 (0)
4	0 (0)
3	0 (0)
2	0 (0)
1	0 (11.7)

IC705

7	5.1 (5.1)	8	5.2(5.2)
6	0 (0)	9	5.1(5.1)
5	0.7(0.7)	10	0 (0)
4	0 (0)	11	0 (0)
3	0.7(0.7)	12	5.1(5.1)
2	-32.6(-32.6)	13	0 (0)
1	5.2(5.2)	14	-3.5(-3.5)

IC706

1	2	3	4	5	6	7
0 (0)	0.2(5.2)	0.2(12.0)	0.2(6.4)	0.2(7.7)	0.2(5.3)	0.2(6.4)
14	13	12	11	10	9	8
5.1(5.1)	0 (0)	0 (0)	0.3 (0.3)	0.3(0.3)	0.3 (2.9)	0.2(1.9)

IC707

1	2	3	4	5	6	7
5.2(5.2)	5.2(5.2)	0 (0)	5.2(5.2)	0 (0)	0 (0)	0 (0)
14	13	12	11	10	9	8
5.2(5.2)	5.2(5.2)	5.2(5.2)	0 (0)	5.2(5.2)	0 (0)	5.1(5.1)

IC708

1	2	3	4	5	6	7
5.1 (5.1)	5.1(5.1)	0 (0)	5.1(5.1)	0 (0)	0 (0)	0 (0)
14	13	12	11	10	9	8
5.2(5.2)	5.1(5.1)	5.1(5.1)	0 (0)	5.2(5.2)	0 (0)	0 (0)

PG701

9	DEFEAT
8	BH
7	BL
6	BU
5	VT
4	GND
3	$\overline{\text{PB}}$12V
2	AFS 2
1	AFS1

To
TUNER/IF
PG752
VIA
CNW701

PG702

1	32V
2	A10V
3	GND
4	A5V
5	–30V

To
JACK
PG4792
VIA
CNW702

PG704

1	CLOCK
2	40V

To
JACK
PG4793
VIA
CNW704

PG714

1	SYNC
2	f_H
3	VERTICAL DRIVE
4	TUNING SELECT

To
JACK
PG4716
VIA
CNW714

PG716

1	PROGRAMME INDI.
2	DC/AC
3	$\overline{\text{SCLK}}$
4	SO
5	SI
6	RESET
7	REQ
8	TUNING INH.
9	SEARCH STOP
10	GND

To
TIMER
CN716

PG717

1	9.5V
2	MAT 1
3	MAT 2
4	MAT 3
5	MAT 5
6	MAT 6
7	P31
8	P30
9	RESET

To
TIMER
CN717

Q701

B	0 (0.1)
C	0 (0)
E	0 (0)

Q702

B	0 (0)
C	0 (0)
E	0 (0)

QR703

B	1.0(1.0)
C	0.5(0.5)
E	0 (0)

Q705

B	0 (0)
C	0.8 (0.8)
E	0 (0)

Q706

B	0.1 (0.1)
C	1.9 (1.9)
E	0 (0)

Q707

B	0.8(0.8)
C	0.6(0.6)
E	0 (0)

Q709

B	0.8 0.8
C	2.7 (2.7)
E	2.9(2.9)

Q713

B	0 (0.8)
C	4.0(0)
E	0 (0)

Q714

B	0 (2.8)
C	7.0(0.1)
E	0 (0)

Q722

B	0 (0)
C	0.4 0.4
E	0 (0)

Q724

B	0.5 0.5
C	0 (0)
E	10.0(10.0)

Q733

B	31.9 31.9
C	4.5 (4.5)
E	32.5(32.5)

Q736

B	0.6 0.6
C	0 (0)
E	0 (0)

※VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

E D C B A

1 2 3 4 5 6 7 8

MULTIPLEX DEMODULATOR [Except for UK model]

SCHEMATIC DIAGRAM GUIDE	PAGE (UK)/(E)	SCHEMATIC DIAGRAM GUIDE	PAGE (UK)/(E)
TUNER/IF	58/67	OPERATION SW/ TAPE COUNTER DISPLAY	109/109
TUNER PACK	61/71	SYSTEM CONTROL	118/118
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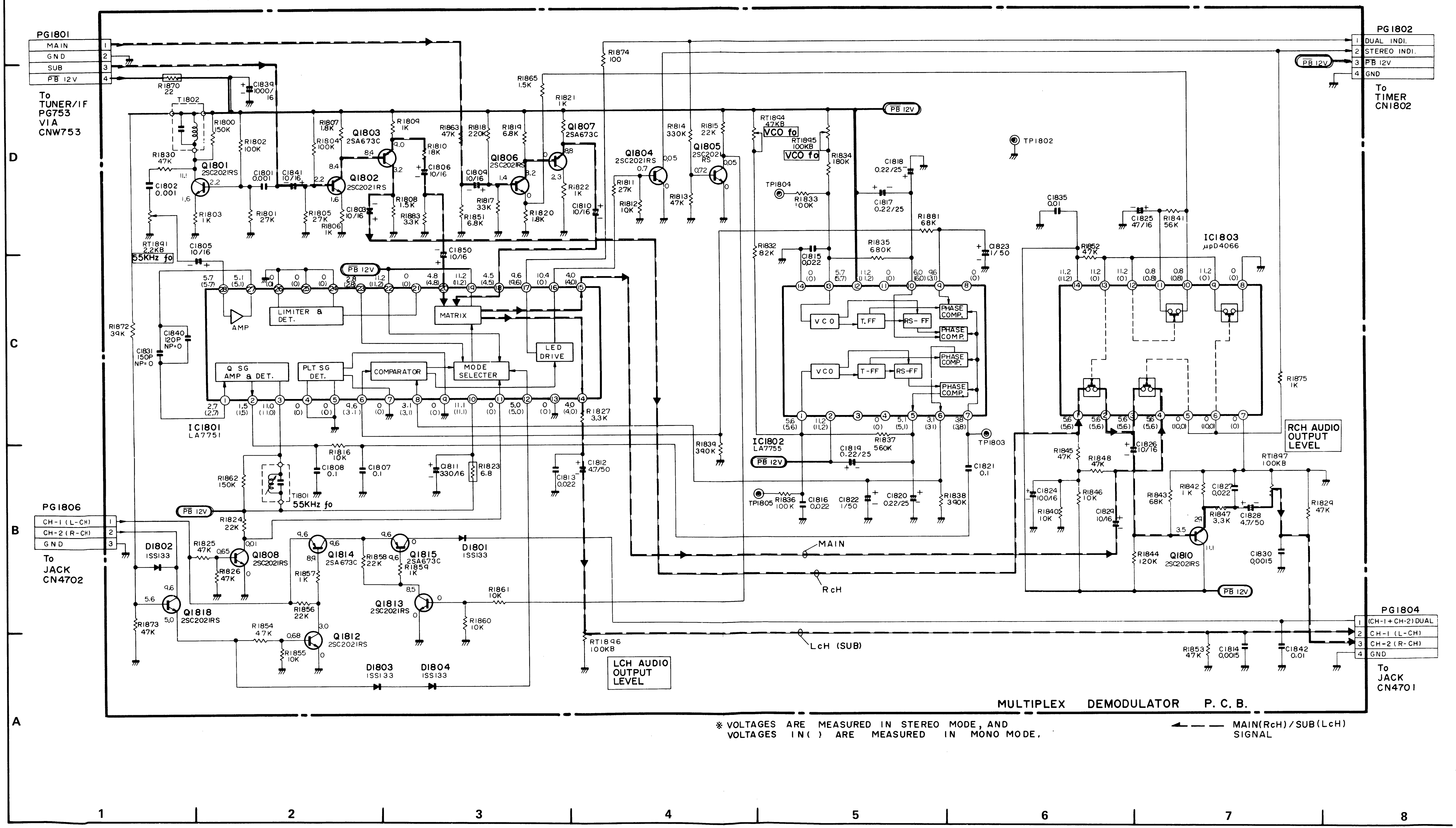
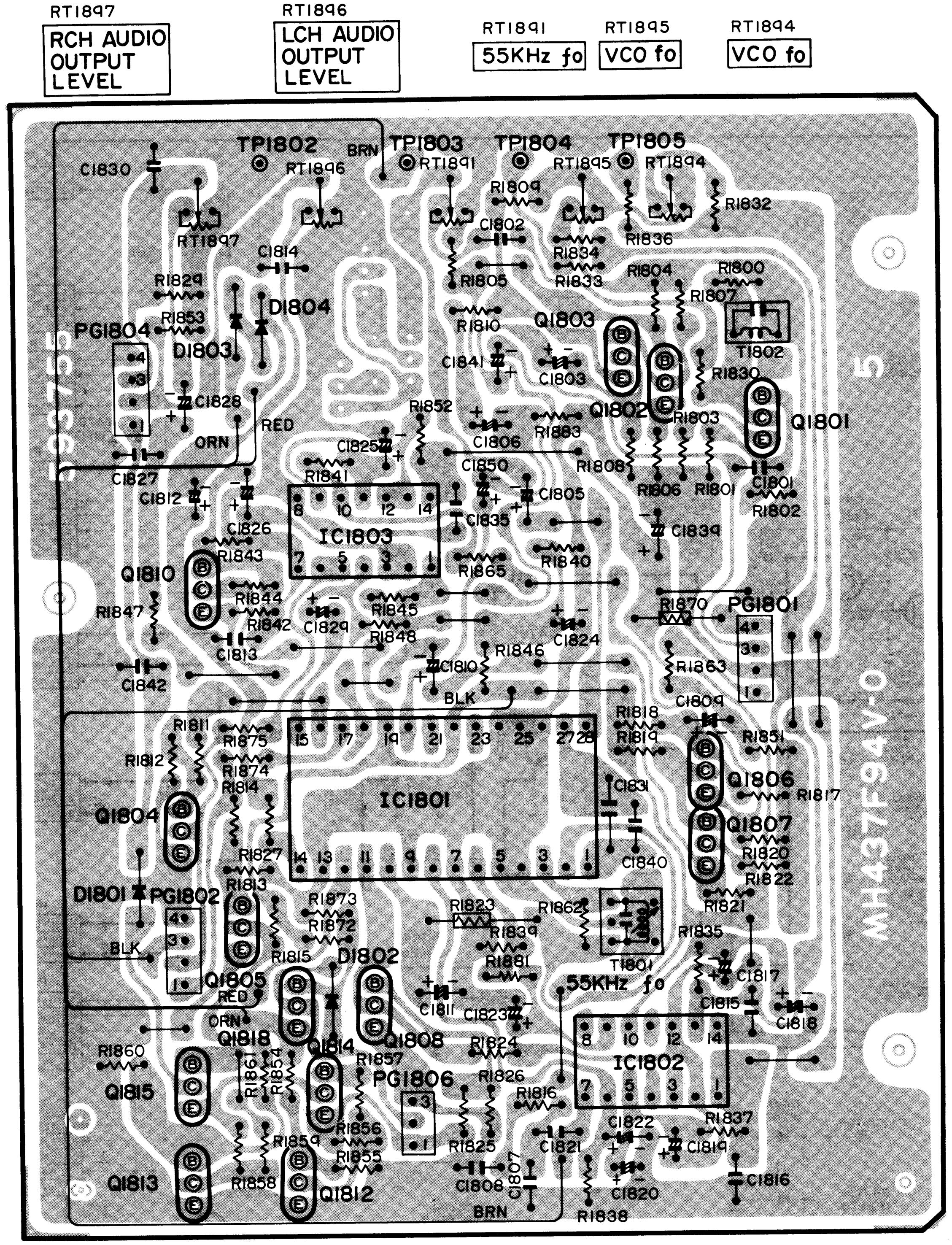
MPX DEMODULATOR	— 77	TIMER	135/135
JACK	81/85	RECTIFIER	139/139
Y/CHROMA	90/98	RF CONVERTER	141/141
FM AUDIO	106/106		
LINEAR AUDIO	115/115		


E
D
C
B
A
1
2
3
4
5
6
7
8
PG1801
MAIN
GND
SUB
PB 12V
To TUNER/IF PG753 VIA CNW753
R1870 22
C1839 1000/16
T1802
R1800 150K
R1802 100K
R1830 47K
Q1801 2SC2021RS
C1802 0.001
R1803 1K
C1801 0.001
C1841 10/16
R1801 27K
RT1891 2.2KB
55KHz fo
C1805 10/16
R1872 39K
C1840 120P NP=0
C1831 150P NP=0
R1807 1.8K
R1804 100K
Q1803 2SA673C
R1809 1K
R1810 18K
C1806 10/16
Q1802 2SC2021RS
R1805 27K
R1806 1K
C1803 10/16
R1808 1.5K
R1883 3.3K
C1850 10/16
R1863 47K
R1818 220K
R1819 6.8K
R1865 1.5K
R1821 1K
Q1807 2SA673C
Q1806 2SC2021RS
C1809 10/16
R1817 33K
R1851 6.8K
R1820 1.8K
R1822 1K
C1810 10/16
R1874 100
Q1804 2SC2021RS
R1811 27K
R1812 10K
R1814 330K
R1815 22K
Q1805 2SC2021RS
R1813 47K
RT1894 47KB
VCO fo
RT1895 100KB
VCO fo
R1834 180K
TP1804
R1833 100K
C1818 0.22/25
C1817 0.22/25
R1881 68K
R1832 82K
C1815 0.022
R1835 680K
C1823 1/50
TP1802
C1835 0.01
C1825 47/16
R1841 56K
R1852 47K
IC1803 μPD4066
PB 12V
LIMITER & DET.
MATRIX
AMP
LED DRIVE
Q SG AMP & DET.
PLT SG DET.
COMPARATOR
MODE SELECTER
IC1801 LA7751
R1827 3.3K
VCO
T.FF
RS-FF
PHASE COMP.
T-FF
IC1802 LA7755
TP1803
R1837 560K
C1819 0.22/25
C1821 0.1
R1816 10K
C1808 0.1
C1807 0.1
C1811 330/16
R1823 6.8
R1862 150K
T1801
55KHz fo
C1812 4.7/50
C1813 0.022
R1839 390K
TP1805
R1836 100K
C1816 0.022
C1822 1/50
C1820 0.22/25
R1838 390K
RCH AUDIO OUTPUT LEVEL
R1875 1K
R1845 47K
R1848 47K
C1826 10/16
RT1897 100KB
C1824 100/16
R1840 10K
R1846 10K
C1829 10/16
R1843 68K
R1842 1K
C1827 0.022
R1847 3.3K
C1828 4.7/50
R1829 47K
R1844 120K
Q1810 2SC2021RS
C1830 0.0015
PG1802
DUAL INDI.
STEREO INDI.
PB 12V
GND
To TIMER CN1802
PG1806
CH-1 (L-CH)
CH-2 (R-CH)
GND
To JACK CN4702
D1802 1SS133
R1825 47K
Q1808 2SC2021RS
R1826 47K
R1824 22K
Q1818 2SC2021RS
R1873 47K
Q1814 2SA673C
R1857 1K
R1858 22K
Q1815 2SA673C
R1859 1K
D1801 1SS133
R1856 22K
Q1813 2SC2021RS
R1861 10K
R1860 10K
R1854 47K
R1855 10K
Q1812 2SC2021RS
D1803 1SS133
D1804 1SS133
MAIN
RcH
LcH (SUB)
RT1896 100KB
LCH AUDIO OUTPUT LEVEL
R1853 47K
C1814 0.0015
C1842 0.01
PG1804
(CH-1+CH-2) DUAL
CH-1 (L-CH)
CH-2 (R-CH)
GND
To JACK CN4701
MULTIPLEX DEMODULATOR P.C.B.

※ VOLTAGES ARE MEASURED IN STEREO MODE, AND VOLTAGES IN ( ) ARE MEASURED IN MONO MODE.

◄— — — MAIN(RcH)/SUB(LcH) SIGNAL


RT1897
RCH AUDIO OUTPUT LEVEL
RT1896
LCH AUDIO OUTPUT LEVEL
RT1891
55KHz fo
RT1895
VCO fo
RT1894
VCO fo
TP1802
TP1803
TP1804
TP1805
BRN
C1830
RT1897
C1814
D1804
R1829
R1853
PG1804
D1803
C1828
RED
ORN
C1827
C1812
C1826
R1843
Q1810
R1847
R1844
R1842
C1813
C1842
C1829
R1845
R1848
R1841
C1825
R1852
C1806
R1883
C1850
C1835
C1805
IC1803
R1865
R1840
R1809
C1802
R1834
R1833
R1836
R1805
R1810
Q1803
C1841
C1803
R1804
R1800
R1807
R1832
T1802
R1830
Q1802
R1803
Q1801
R1808
R1806
R1801
C1801
R1802
C1839
R1870
PG1801
C1824
R1846
C1810
BLK
R1863
C1809
R1818
R1819
R1851
R1811
R1875
R1812
R1874
R1814
IC1801
C1831
Q1806
R1817
Q1804
Q1807
R1827
C1840
R1820
R1822
D1801
PG1802
R1813
R1873
R1872
R1823
R1839
R1862
R1821
T1801
R1835
BLK
R1815
D1802
R1861
55KHz fo
C1817
Q1805
RED
ORN
C1811
C1823
C1815
C1818
Q1818
Q1814
Q1808
R1824
IC1802
R1860
R1861
R1854
R1857
PG1806
R1826
R1816
R1837
Q1815
R1856
R1825
C1821
C1822
C1819
R1859
R1855
C1807
Q1813
R1858
Q1812
C1808
BRN
C1820
R1838
C1816
MH437F94V-0
5
783755

MULTIPLEX DEMODULATOR P.C.B

IC1801

15	16	17	18	19	20	21	22	23	24	25	26	27	28
4.0(4.0)	10.4 (0)	9.6 (9.6)	4.5 (4.5)	11.2 (11.2)	4.8(4.8)	0(0)	11.2 (11.2)	2.8(2.8)	0(0)	0(0)	0(0)	5.1 (5.1)	5.7(5.7)
14	13	12	11	10	9	8	7	6	5	4	3	2	1
4.0(4.0)	0 (0)	5.0 (5.0)	0(0)	11.1 (11.1)	0(0)	3.1 (3.1)	0(0)	9.6(3.1)	0(0)	0(0)	11.0 (11.0)	1.5 (1.5)	2.7 (2.7)

IC1802

8	9	10	11	12	13	14
0(0)	9.6 (3.1)	6.0 (6.0)	0(0)	11.2(11.2)	5.7 (5.7)	0(0)
7	6	5	4	3	2	1
3.8(3.8)	3.1 (3.1)	5.1 (5.1)	0(0)	——	11.2 (11.2)	5.6 (5.6)

IC1803

8	9	10	11	12	13	14
0(0)	11.2 (0)	0.8 (0.8)	0.8 (0.8)	11.2(0)	11.2 (0)	11.2 (11.2)
7	6	5	4	3	2	1
0(0)	0 (10.0)	0 (10.0)	5.6 (5.6)	5.6 (5.6)	5.6(5.6)	5.6 (5.6)

Q1801

B	2.2
C	11.1
E	1.6

Q1802

B	2.2
C	8.4
E	1.6

Q1803

B	8.4
C	3.2
E	9.0

Q1804

B	0.7
C	0.05
E	0

Q1805

B	0.72
C	0.05
E	0

Q1806

B	1.4
C	8.2
E	0

Q1807

B	0
C	2.3
E	8.8

Q1808

B	0.65
C	0.01
E	0

Q1810

B	3.5
C	11.1
E	2.9

Q1812

B	0.68
C	3.0
E	0

Q1813

B	0
C	8.5
E	0

Q1814

B	8.9
C	9.6
E	9.6

Q1815

B	9.6
C	0
E	9.6

Q1818

B	5.6
C	9.6
E	5.0

※ VOLTAGES ARE MEASURED IN STEREO MODE, AND
VOLTAGES IN ( ) ARE MEASURED IN MONO MODE.

PG1801

1	MAIN
2	GND
3	SUB
4	$\overline{\text{PB}}$12V

To
TUNER/IF
PG753
VIA
CNW753

PG1802

1	DUAL INDI.
2	STEREO INDI.
3	$\overline{\text{PB}}$12V
4	GND

To
TIMER
CN1802

PG1804

1	(CH-1+CH-2)DUAL
2	CH-1(L-CH)
3	CH-2(R-CH)
4	GND

To
JACK
CN4701

PG1806

1	CH-1(L-CH)
2	CH-2(R-CH)
3	GND

To
JACK
CN4702

JACK [For UK model]

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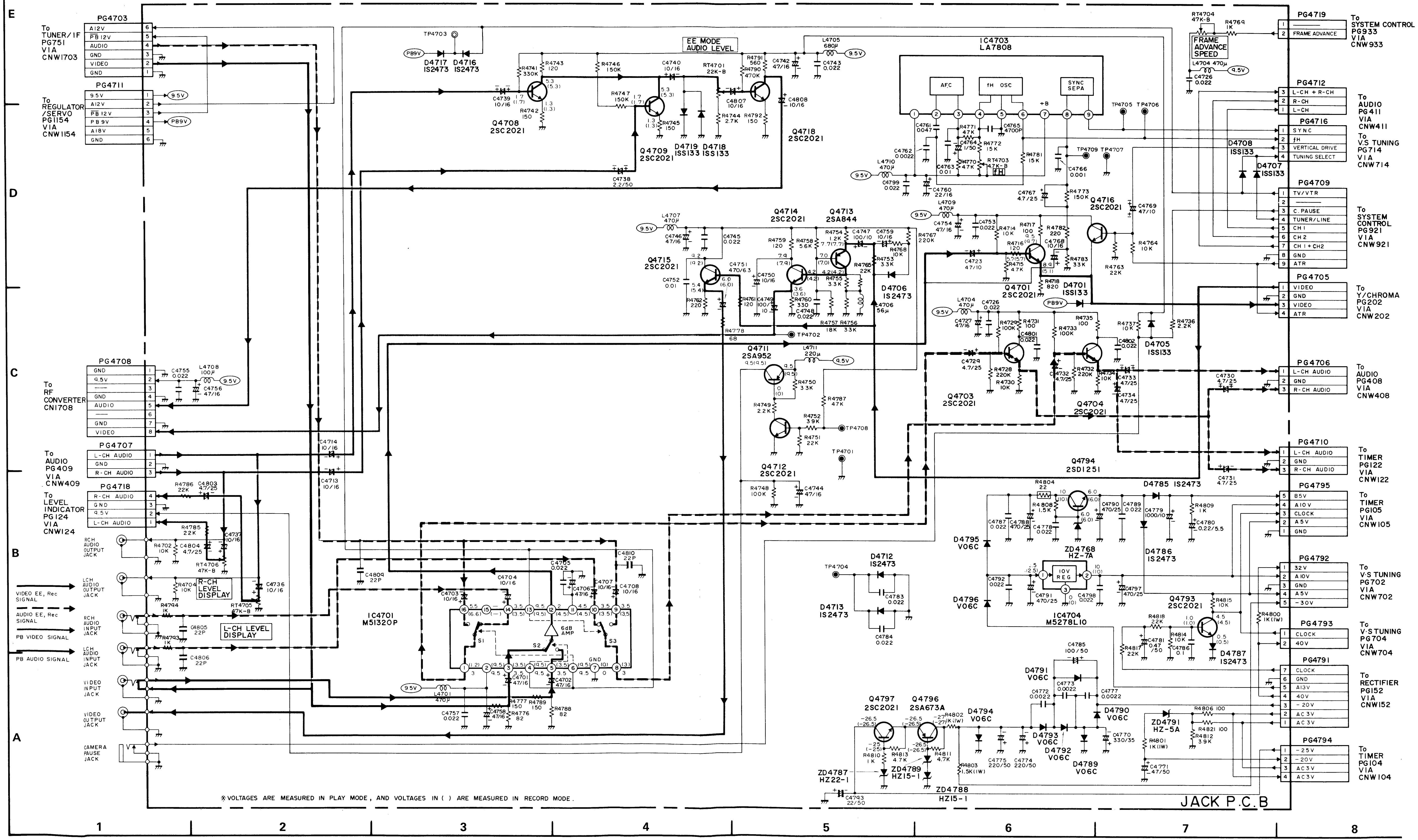
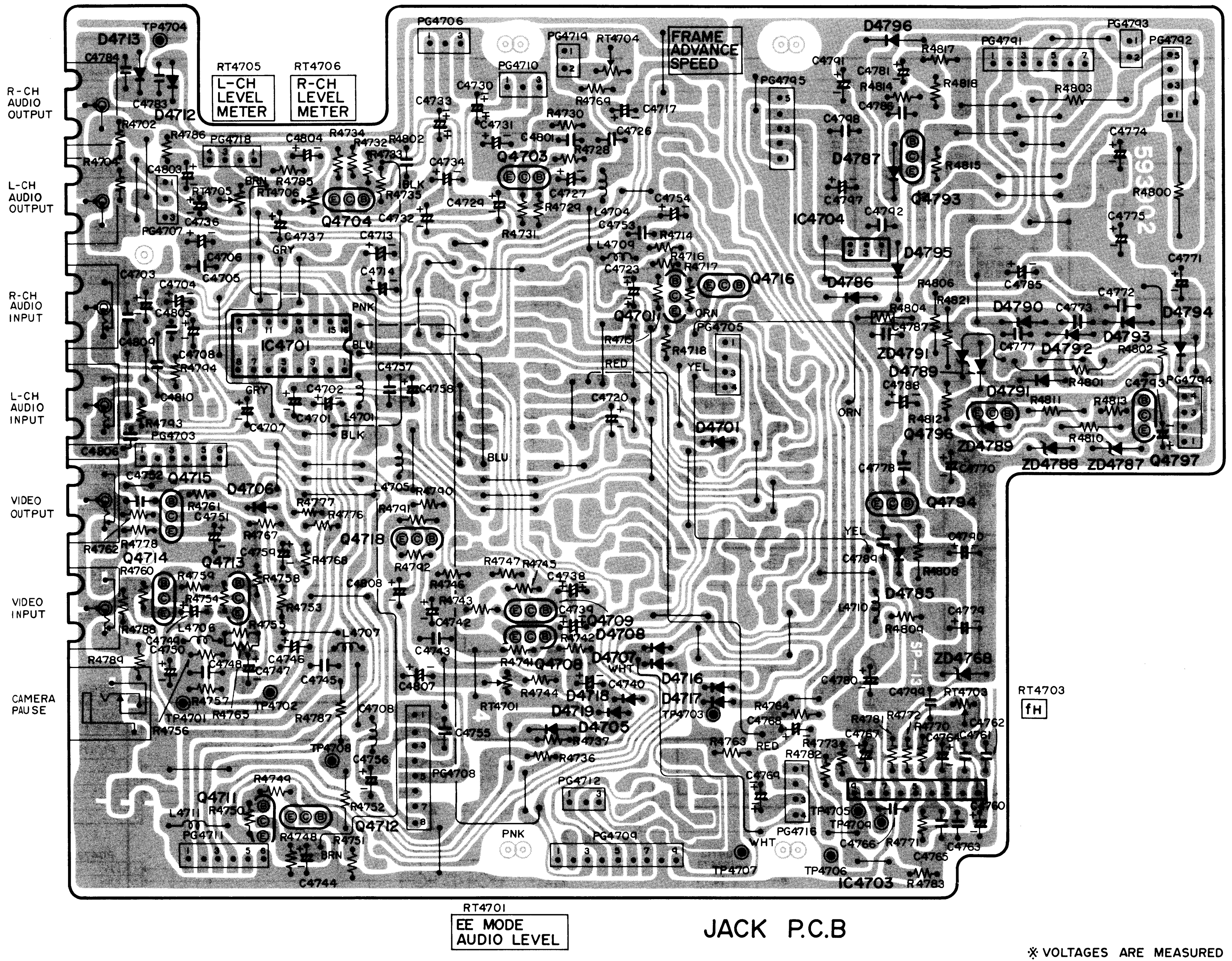
Y/CHROMA	90/98	RF CONVERTER	141/141
FM AUDIO	106/106		
LINEAR AUDIO	115/115		


E
D
C
B
A
1
2
3
4
5
6
7
8
PG4703
To TUNER/IF PG751 VIA CNW1703
A12V
PB 12V
AUDIO
GND
VIDEO
GND
PG4711
To REGULATOR /SERVO PG1154 VIA CNW1154
9.5V
A12V
PB 12V
PB 9V
A18V
GND
PG4708
To RF CONVERTER CN1708
GND
9.5V
AUDIO
VIDEO
PG4707
To AUDIO PG409 VIA CNW409
L-CH AUDIO
GND
R-CH AUDIO
PG4718
To LEVEL INDICATOR PG124 VIA CNW124
R-CH AUDIO
GND
9.5V
L-CH AUDIO
RCH AUDIO OUTPUT JACK
LCH AUDIO OUTPUT JACK
RCH AUDIO INPUT JACK
LCH AUDIO INPUT JACK
VIDEO INPUT JACK
VIDEO OUTPUT JACK
CAMERA PAUSE JACK
VIDEO EE, Rec SIGNAL
AUDIO EE, Rec SIGNAL
PB VIDEO SIGNAL
PB AUDIO SIGNAL
R-CH LEVEL DISPLAY
L-CH LEVEL DISPLAY
TP4703
PB9V
D4717 D4716 IS2473 IS2473
EE MODE AUDIO LEVEL
Q4708 2SC2021
Q4709 2SC2021
D4719 D4718 ISS133 ISS133
Q4718 2SC2021
L4705 680μ
IC4703 LA7808
AFC
fH OSC
SYNC SEPA
+B
TP4705 TP4706
TP4709 TP4707
Q4714 2SC2021
Q4713 2SA844
Q4715 2SC2021
Q4716 2SC2021
Q4701 2SC2021
D4701 ISS133
D4706 IS2473
TP4702
Q4711 2SA952
Q4712 2SC2021
TP4708
TP4701
Q4703 2SC2021
Q4704 2SC2021
D4705 ISS133
IC4701 M51320P
6dB AMP
S1
S2
S3
Q4794 2SD1251
D4785 IS2473
D4795 V06C
ZD4768 HZ-7A
D4786 IS2473
D4796 V06C
IC4704 M5278L10
10V REG
Q4793 2SC2021
D4787 IS2473
TP4704
D4712 IS2473
D4713 IS2473
Q4797 2SC2021
Q4796 2SA673A
D4791 V06C
D4794 V06C
D4793 V06C
D4792 V06C
D4790 V06C
D4789 V06C
ZD4791 HZ-5A
ZD4787 HZ22-1
ZD4789 HZ15-1
ZD4788 HZ15-1
FRAME ADVANCE SPEED
RT4704 47K-B
PG4719
To SYSTEM CONTROL PG933 VIA CNW933
FRAME ADVANCE
PG4712
To AUDIO PG411 VIA CNW411
L-CH + R-CH
R-CH
L-CH
PG4716
To V.S TUNING PG714 VIA CNW714
SYNC
fH
VERTICAL DRIVE
TUNING SELECT
D4708 ISS133
D4707 ISS133
PG4709
To SYSTEM CONTROL PG921 VIA CNW921
TV/VTR
C. PAUSE
TUNER/LINE
CH1
CH2
CH1+CH2
GND
ATR
PG4705
To Y/CHROMA PG202 VIA CNW202
VIDEO
GND
VIDEO
ATR
PG4706
To AUDIO PG408 VIA CNW408
L-CH AUDIO
GND
R-CH AUDIO
PG4710
To TIMER PG122 VIA CNW122
L-CH AUDIO
GND
R-CH AUDIO
PG4795
To TIMER PG105 VIA CNW105
B5V
A10V
CLOCK
A5V
GND
PG4792
To V.S TUNING PG702 VIA CNW702
32V
A10V
GND
A5V
-30V
PG4793
To V.S TUNING PG704 VIA CNW704
CLOCK
40V
PG4791
To RECTIFIER PG152 VIA CNW152
CLOCK
GND
A13V
40V
-20V
AC3V
AC3V
PG4794
To TIMER PG104 VIA CNW104
-25V
-20V
AC3V
AC3V
JACK P.C.B

※VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.


E
D
C
B
A
R-CH AUDIO OUTPUT
L-CH AUDIO OUTPUT
R-CH AUDIO INPUT
L-CH AUDIO INPUT
VIDEO OUTPUT
VIDEO INPUT
CAMERA PAUSE
RT4705
L-CH LEVEL METER
RT4706
R-CH LEVEL METER
FRAME ADVANCE SPEED
RT4704
IC4701
IC4703
IC4704
Q4701
Q4703
Q4704
Q4708
Q4709
Q4711
Q4712
Q4713
Q4714
Q4715
Q4716
Q4718
Q4793
Q4794
Q4796
Q4797
PG4703
PG4705
PG4706
PG4707
PG4708
PG4709
PG4710
PG4711
PG4712
PG4716
PG4718
PG4719
PG4791
PG4792
PG4793
PG4794
PG4795
RT4703
fH
RT4701
EE MODE AUDIO LEVEL

JACK P.C.B

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

IC4701

9	10	11	12	13	14	15	16
3.5(3.5)	3.5(3.5)	4.5(4.5)	2 (4.5)	9.5(9.5)	3.5(3.5)	— (—)	5.5(6.6)
8	7	6	5	4	3	2	1
3 (3)	0 (0)	9.5(9.5)	3.5(3.5)	9.5(9.5)	3.5(3.5)	9.5(9.5)	3 (1.2)

PG4703

6	A12V
5	$\overline{\text{PB}}$12V
4	AUDIO
3	GND
2	VIDEO
1	GND

To
TUNER/IF
PG751 VIA
CNW1703

PG4705

1	VIDEO
2	GND
3	VIDEO
4	ATR

To
Y/CHROMA
PG202
VIA
CNW202

PG4706

1	LCH AUDIO
2	GND
3	RCH AUDIO

To
AUDIO
PG408
VIA
CNW408

PG4707

1	LCH AUDIO
2	GND
3	RCH AUDIO

To
AUDIO
PG409 VIA
CNW409

PG4708

1	GND
2	9.5V
3	———
4	GND
5	AUDIO
6	———
7	GND
8	VIDEO

To
RF CONVERTER
CN1708

PG4709

1	TV/VTR
2	REMOTE
3	C. PAUSE
4	TUNER / LINE
5	CH1
6	CH2
7	CH1 + CH2
8	GND
9	ATR

To
SYSTEM CONTROL
PG921 VIA
CNW921

PG4710

1	LCH AUDIO
2	GND
3	RCH AUDIO

To
TIMER
PG122 VIA
CNW122

PG4711

1	9.5V
2	A12V
3	$\overline{\text{PB}}$12V
4	PB9V
5	A18V
6	GND

To
REGULATOR/
SERVO
PG1154
VIA
CNW1154

PG4712

3	LCH + RCH
2	RCH
1	LCH

To
AUDIO
PG411 VIA
CNW411

PG4716

1	SYNC
2	fH
3	VERTICAL DRIVE
4	TUNING SELECT

To
V.S TUNING
PG714 VIA
CNW714

PG4718

4	RCH AUDIO
3	GND
2	9.5V
1	LCH AUDIO

To
LEVEL INDICATOR
PG124 VIA
CNW124

PG4719

1	———
2	FRAME ADVANCE

To
SYSTEM CONTROL
PG933 VIA
CNW933

PG4791

7	CLOCK
6	GND
5	A13V
4	40V
3	−20V
2	AC3V
1	AC3V

To
RECTIFIER
PG152 VIA
CNW152

PG4792

5	−30V
4	A5V
3	GND
2	A10V
1	32V

To
V.S TUNING
PG702
VIA
CNW702

IC4704

2	3	1
10.0(10.0)	0 (0)	12.5(12.5)

PG4793

1	CLOCK
2	40V

To
V.S TUNING
PG704 VIA
CNW704

PG4794

4	AC3V
3	AC3V
2	−20V
1	−25V

To
TIMER
PG104 VIA
CNW104

PG4795

5	B5V
4	A10V
3	CLOCK
2	A5V
1	GND

To
TIMER
PG105
VIA
CNW105

Q4701

B	5.7(5.7)
C	9.5(9.7)
E	8.9(5.1)

Q4703

B	5.7(5.7)
C	9.7(9.7)
E	5.1(5.1)

Q4704

B	5.7(5.7)
C	9.7(9.7)
E	5.1(5.1)

Q4708

B	1.7(1.7)
C	5.3(5.3)
E	1.3(1.3)

Q4709

B	1.7(1.7)
C	5.3(5.3)
E	1.3(1.3)

Q4711

B	0 (0)
C	9.5(9.5)
E	9.5(9.5)

Q4

Q4713

B	7.0(7.0)
C	4.2(4.2)
E	7.7(7.7)

Q4714

B	4.2(4.2)
C	7.9(7.9)
E	3.6(3.6)

Q4715

B	6.0(6.0)
C	9.2(9.2)
E	5.4(5.4)

Q4793

B	1.0(1.0)
C	4.5(4.5)
E	0.5(0.5)

Q4794

B	6.0(6.0)
C	10 (10)
E	6.0(6.0)

Q4796

B	-26.5(-26.5)
C	-27(-27)
E	-26(-26)

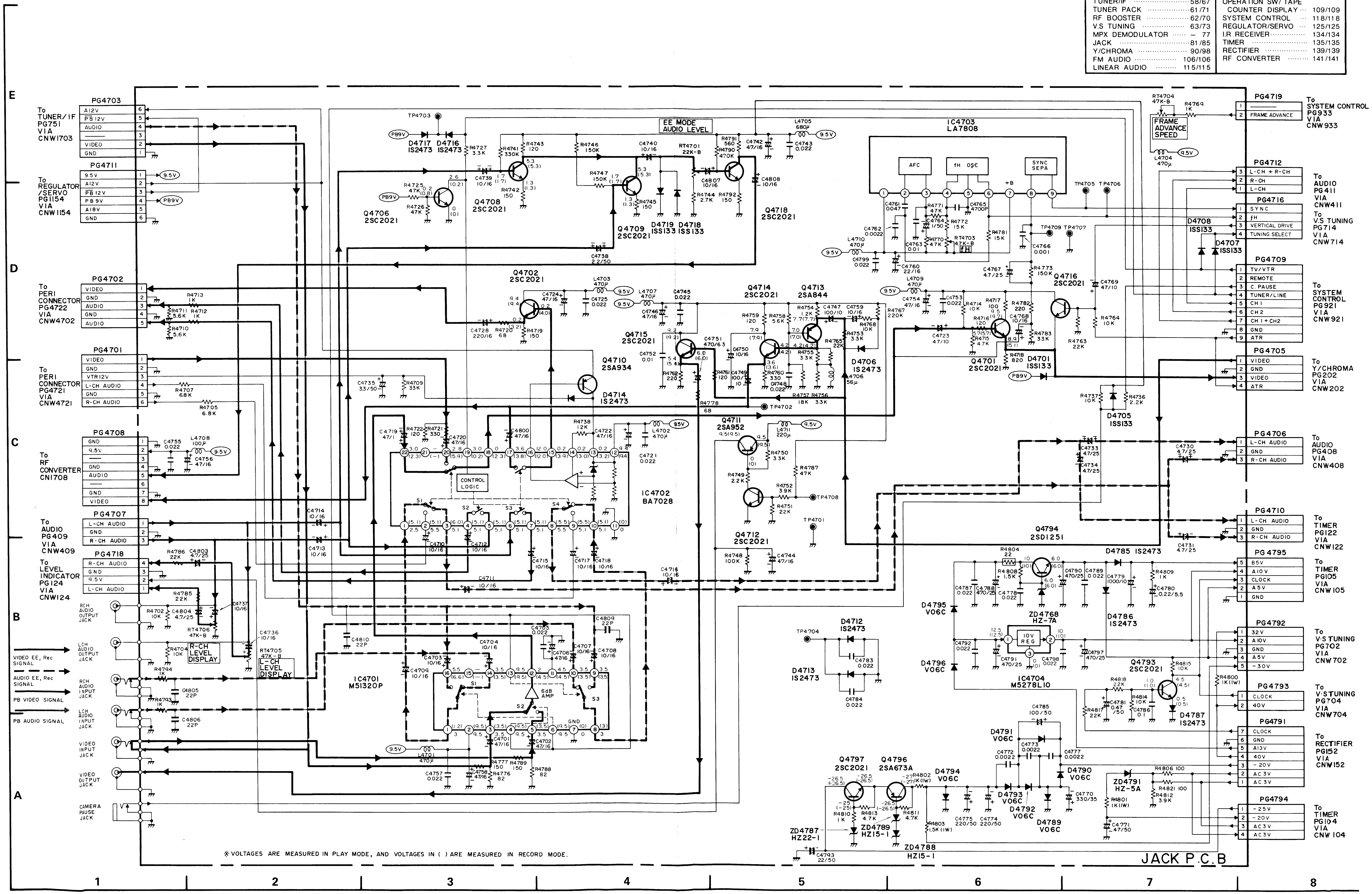
Q4797

B	-25(-25)
C	-26.5(-26.5)
E	-26.5(-26.5)

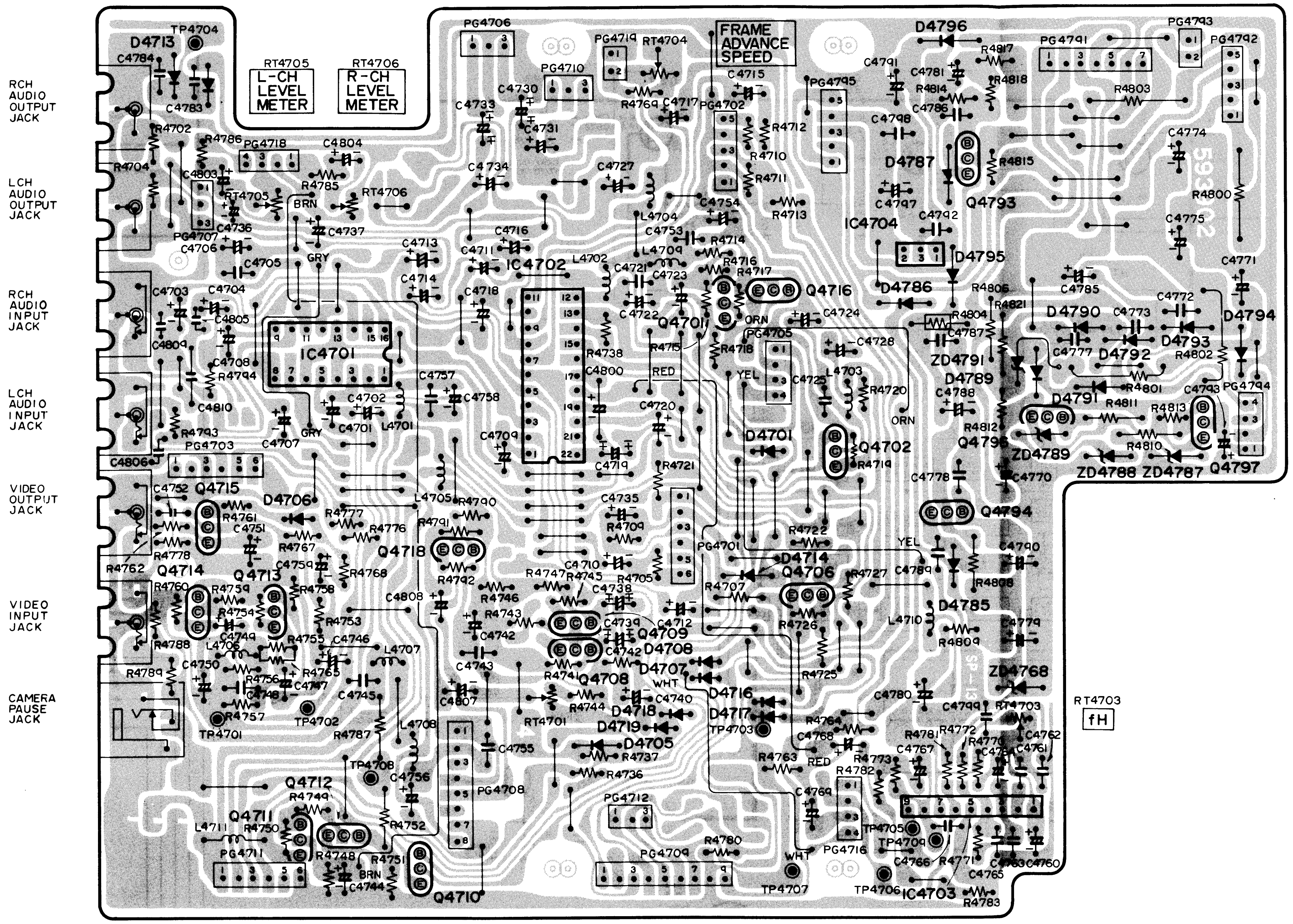
1 2 3 4 5 6 7 8

JACK [Except for UK model]

SCHEMATIC DIAGRAM GUIDE	PAGE (UK)/(E)	SCHEMATIC DIAGRAM GUIDE	PAGE (UK)/(E)
TUNER/IF	58/67	OPERATION SW/ TAPE COUNTER DISPLAY	109/109
TUNER PACK	61/71	SYSTEM CONTROL	118/118
RF BOOSTER	62/70	REGULATOR/SERVO	125/125
V.S TUNING	63/73	I.R RECEIVER	134/134
MPX DEMODULATOR	– 77	TIMER	135/135
JACK	81/85	RECTIFIER	139/139
Y/CHROMA	90/98	RF CONVERTER	141/141
FM AUDIO	106/106		
LINEAR AUDIO	115/115		


E
D
C
B
A
1
2
3
4
5
6
7
8
PG4703
To TUNER/IF PG751 VIA CNW1703
A12V
PB 12V
AUDIO
VIDEO
GND
PG4711
To REGULATOR /SERVO PG1154 VIA CNW1154
9.5V
A12V
PB 12V
PB 9V
A18V
GND
PG4702
To PERI CONNECTOR PG4722 VIA CNW4702
VIDEO
GND
AUDIO
GND
AUDIO
PG4701
To PERI CONNECTOR PG4721 VIA CNW4721
VIDEO
GND
VTR 12V
L-CH AUDIO
GND
R-CH AUDIO
PG4708
To RF CONVERTER CN1708
GND
9.5V
GND
AUDIO
GND
VIDEO
PG4707
To AUDIO PG409 VIA CNW409
L-CH AUDIO
GND
R-CH AUDIO
PG4718
To LEVEL INDICATOR PG124 VIA CNW124
R-CH AUDIO
GND
9.5V
L-CH AUDIO
RCH AUDIO OUTPUT JACK
LCH AUDIO OUTPUT JACK
RCH AUDIO INPUT JACK
LCH AUDIO INPUT JACK
VIDEO INPUT JACK
VIDEO OUTPUT JACK
CAMERA PAUSE JACK
VIDEO EE, Rec SIGNAL
AUDIO EE, Rec SIGNAL
PB VIDEO SIGNAL
PB AUDIO SIGNAL
R-CH LEVEL DISPLAY
L-CH LEVEL DISPLAY
RT4706 47K-B
RT4705 47K-B
TP4703
PB9V
D4717 IS2473
D4716 IS2473
Q4706 2SC2021
Q4708 2SC2021
Q4709 2SC2021
D4719 ISS133
D4718 ISS133
Q4718 2SC2021
EE MODE AUDIO LEVEL
RT4701 22K-B
L4705 680μ
9.5V
IC4703 LA7808
AFC
fH OSC
SYNC SEPA
TP4705
TP4706
TP4709
TP4707
RT4703 47K-B (TH)
Q4702 2SC2021
Q4710 2SA934
D4714 IS2473
Q4715 2SC2021
Q4714 2SC2021
Q4713 2SA844
D4706 IS2473
Q4701 2SC2021
D4701 ISS133
Q4716 2SC2021
TP4702
Q4711 2SA952
Q4712 2SC2021
TP4708
TP4701
IC4702 BA7028
CONTROL LOGIC
S1
S2
S3
S4
IC4701 M51320P
6dB AMP
D4705 ISS133
D4708 ISS133
D4707 ISS133
RT4704 47K-B
FRAME ADVANCE SPEED
L4704 470μ
Q4794 2SD1251
D4785 IS2473
D4786 IS2473
D4795 V06C
D4796 V06C
ZD4768 HZ-7A
10V REG
IC4704 M5278L10
Q4793 2SC2021
D4787 IS2473
TP4704
D4712 IS2473
D4713 IS2473
D4791 V06C
D4790 V06C
D4794 V06C
D4793 V06C
D4792 V06C
D4789 V06C
ZD4791 HZ-5A
Q4797 2SC2021
Q4796 2SA673A
ZD4787 HZ22-1
ZD4789 HZ15-1
ZD4788 HZ15-1
PG4719
To SYSTEM CONTROL PG933 VIA CNW933
FRAME ADVANCE
PG4712
To AUDIO PG411 VIA CNW411
L-CH + R-CH
R-CH
L-CH
PG4716
To V.S TUNING PG714 VIA CNW714
SYNC
fH
VERTICAL DRIVE
TUNING SELECT
PG4709
To SYSTEM CONTROL PG921 VIA CNW921
TV/VTR
REMOTE
C. PAUSE
TUNER/LINE
CH 1
CH 2
CH 1 + CH2
GND
ATR
PG4705
To Y/CHROMA PG202 VIA CNW202
VIDEO
GND
VIDEO
ATR
PG4706
To AUDIO PG408 VIA CNW408
L-CH AUDIO
GND
R-CH AUDIO
PG4710
To TIMER PG122 VIA CNW122
L-CH AUDIO
GND
R-CH AUDIO
PG4795
To TIMER PG105 VIA CNW105
B5V
A10V
CLOCK
A5V
GND
PG4792
To V.S TUNING PG702 VIA CNW702
32V
A10V
GND
A5V
-30V
PG4793
To V.STUNING PG704 VIA CNW704
CLOCK
40V
PG4791
To RECTIFIER PG152 VIA CNW152
CLOCK
GND
A13V
40V
-20V
AC 3V
AC 3V
PG4794
To TIMER PG104 VIA CNW104
-25V
-20V
AC3V
AC3V
JACK P.C.B

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.


RCH AUDIO OUTPUT JACK
LCH AUDIO OUTPUT JACK
RCH AUDIO INPUT JACK
LCH AUDIO INPUT JACK
VIDEO OUTPUT JACK
VIDEO INPUT JACK
CAMERA PAUSE JACK
RT4705
L-CH LEVEL METER
RT4706
R-CH LEVEL METER
FRAME ADVANCE SPEED
IC4701
IC4702
IC4703
IC4704
RT4703
fH
RT4701
EE MODE AUDIO LEVEL

JACK P.C.B

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

Q4701

B	5.7(5.7)
C	9.5(9.7)
E	8.9(5.1)

Q4702

B	0.2(4.0)
C	9.4(9.4)
E	0.2(3.2)

Q4706

B	0.2(0.8)
C	2.6(0.2)
E	0 (0)

Q4708

B	1.7(1.7)
C	5.3(5.3)
E	1.3(1.3)

Q4709

B	1.7(1.7)
C	5.3(5.3)
E	1.3(1.3)

Q4710

B	
C	
E	

Q4711

B	0 (0)
C	9.5(9.5)
E	9.5(9.5)

Q4713

B	7.0(7.0)
C	4.2(4.2)
E	7.7(7.7)

Q4714

B	4.2(4.2)
C	7.9(7.9)
E	3.6(3.6)

Q4715

B	6.0(6.0)
C	9.2(9.2)
E	5.4(5.4)

Q4793

B	1.0 1.0
C	4.5(4.5)
E	0.5(0.5)

Q4794

B	6.0(6.0)
C	10.0(10.0)
E	6.0(6.0)

Q4796

B	-26.5(-26.5)
C	-27(-27)
E	-26(-26)

Q4797

B	-25(-25)
C	-26.5(-26.5)
E	-26.5(-26.5)

IC4701

9	10	11	12	13	14	15	16
3.5 (3.5)	3.5(3.5)	4.5 (4.5)	2 (4.5)	9.5 (9.5)	3.5 (3.5)	— (—)	5.5 (6.6)
8	7	6	5	4	3	2	1
3.0 (3.0)	0 (0)	9.5 (9.5)	3.5 (3.5)	9.5 (9.5)	3.5 (3.5)	9.5 (9.5)	3.0 (1.2)

IC4702

11	0 (0)	12	9.4(9.4)
10	5.1(5.1)	13	0.2(3.2)
9	5.1(5.5)	14	0.2(3.0)
8	5.5(5.5)	15	0.2(3.9)
7	5.1(5.1)	16	12.0(12.0)
6	5.1(5.1)	17	3.6(3.8)
5	5.1(5.1)	18	0 (2.3)
4	5.1(5.1)	19	3.0(0.2)
3	5.1 (6.0)	20	2.8(5.9)
2	5.5(5.1)	21	— (—)
1	2.5(5.1)	22	3.0(2.3)

IC4704

2	3	1
10.0(10.0)	0 (0)	12.5(12.5)

PG4701

1	VIDEO
2	GND
3	VTR 12V
4	LCH AUDIO
5	GND
6	RCH AUDIO

To
PERI
CONNECTOR
PG4721 VIA
CNW4701

PG4702

5	AUDIO
4	GND
3	AUDIO
2	GND
1	VIDEO

To
PERI
CONNECTOR
PG4722 VIA
CNW4702

PG4703

6	A12V
5	$\overline{\text{PB}}$12V
4	AUDIO
3	GND
2	VIDEO
1	GND

To
TUNER/IF
PG751 VIA
CNW1703

PG4705

1	VIDEO
2	GND
3	VIDEO
4	ATR

To
Y/CHROMA
PG202 VIA
CNW202

PG4706

1	LCH AUDIO
2	GND
3	RCH AUDIO

To
AUDIO
PG408
VIA
CNW408

PG4707

1	LCH AUDIO
2	GND
3	RCH AUDIO

To
AUDIO
PG409 VIA
CNW409

PG4708

1	GND
2	9.5V
3	——
4	GND
5	AUDIO
6	——
7	GND
8	VIDEO

To
RF CONVERTER
CN 1708

PG4709

1	TV / VTR
2	REMOTE
3	C PAUSE
4	TUNER / LINE
5	CH 1
6	CH 2
7	CH-1 + CH-2
8	GND
9	ATR

To
SYSTEM CONTROL
PG921 VIA
CNW921

PG4710

1	L-CH AUDIO
2	GND
3	R-CH AUDIO

To
TIMER
PG122 VIA
CNW122

PG4711

1	9.5 V
2	A12V
3	$\overline{\text{PB}}$12V
4	PB9V
5	A18V
6	GND

To
REGULATOR/
SERVO
PG1154
VIA
CNW1154

PG4712

3	L-CH+R-CH
2	R-CH
1	L-CH

To
AUDIO
PG411 VIA
CNW411

PG4716

1	SYNC
2	f_H
3	VERTICAL DRIVE
4	TUNING SELECT

To
V.S TUNING
PG714 VIA
CNW714

PG4718

4	LCH AUDIO
3	GND
2	9.5V
1	RCH AUDIO

To
LEVEL INDICATOR
PG124 VIA
CNW124

PG4719

1	——
2	FRAME ADVANCE

To
SYSTEM CONTROL
PG933 VIA
CNW933

PG4791

7	CLOCK
6	GND
5	A13V
4	40V
3	-20V
2	AC3V
1	AC3V

To
RECTIFIER
PG152 VIA
CNW152

PG4792

5	-30V
4	A5V
3	GND
2	A10V
1	32V

To
V.S TUNING
PG702
VIA
CNW702

PG4793

1	CLOCK
2	40V

To
V.S TUNING
PG704 VIA
CNW704

PG4794

4	AC3V
3	AC3V
2	-20V
1	-25V

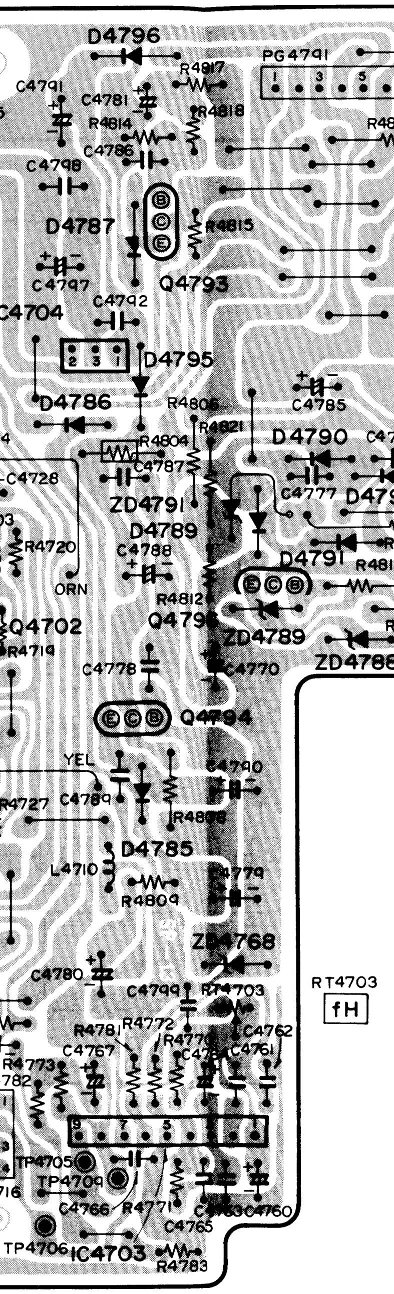
To
TIMER
PG104 VIA
CNW104

PG4795

5	B5V
4	A10V
3	CLOCK
2	A5V
1	GND

To
TIMER
PG105
VIA
CNW105

PERI JACK [Except for UK model]



D4796
PG4793
PG4791
PG4792
C4791
C4781
R4817
R4814
R4818
R4803
C4786
C4798
C4774
D4787
R4815
C4797
Q4793
R4800
C4704
C4792
C4775
D4795
C4771
D4786
R4805
C4785
C4772
R4804
R4821
D4790
C4773
D4794
C4728
C4787
D4793
ZD4791
C4777
D4792
R4802
D4789
R4801
C4793
PG4794
R4720
C4788
D4791
R4811
R4813
ORN
R4812
Q4702
Q4795
ZD4789
R4810
R4719
C4778
C4770
ZD4788
ZD4787
Q4797
Q4794
YEL
C4790
R4727
C4789
R4808
D4785
L4710
C4779
R4809
ZD4768
C4780
C4799
RT4703
R4781
R4772
R4770
C4762
C4767
C4761
R4773
TP4705
TP4709
C4766
R4771
C4763
C4760
C4765
TP4706
IC4703
R4783
RT4703
fH

P.C.B

IC4701

9	10	11	12	13	14	15	16
3.5 (3.5)	3.5(3.5)	4.5 (4.5)	2 (4.5)	9.5 (9.5)	3.5 (3.5)	— (—)	5.5 (6.6)
8	7	6	5	4	3	2	1
3.0 (3.0)	0 (0)	9.5 (9.5)	3.5 (3.5)	9.5 (9.5)	3.5 (3.5)	9.5 (9.5)	3.0 (1.2)

IC4702

11	0 (0)	12	9.4(9.4)
10	5.1(5.1)	13	0.2(3.2)
9	5.1(5.5)	14	0.2(3.0)
8	5.5(5.5)	15	0.2(3.9)
7	5.1(5.1)	16	12.0(12.0)
6	5.1(5.1)	17	3.6(3.8)
5	5.1(5.1)	18	0 (2.3)
4	5.1(5.1)	19	3.0(0.2)
3	5.1 (6.0)	20	2.8(5.9)
2	5.5(5.1)	21	— (—)
1	2.5(5.1)	22	3.0(2.3)

IC4704

2	3	1
10.0(10.0)	0 (0)	12.5(12.5)

PG4701

1	VIDEO
2	GND
3	VTR 12V
4	LCH AUDIO
5	GND
6	RCH AUDIO

To
PERI
CONNECTOR
PG4721 VIA
CNW4701

PG4702

5	AUDIO
4	GND
3	AUDIO
2	GND
1	VIDEO

To
PERI
CONNECTOR
PG4722 VIA
CNW4702

PG4703

6	A12V
5	$\overline{\text{PB}}$12V
4	AUDIO
3	GND
2	VIDEO
1	GND

To
TUNER/IF
PG751 VIA
CNW1703

PG4705

1	VIDEO
2	GND
3	VIDEO
4	ATR

To
Y/CHROMA
PG202 VIA
CNW202

PG4706

1	LCH AUDIO
2	GND
3	RCH AUDIO

To
AUDIO
PG408
VIA
CNW408

PG4707

1	LCH AUDIO
2	GND
3	RCH AUDIO

To
AUDIO
PG409 VIA
CNW409

PG4708

1	GND
2	9.5V
3	——
4	GND
5	AUDIO
6	——
7	GND
8	VIDEO

To
RF CONVERTER
CN 1708

PG4709

1	TV/VTR
2	REMOTE
3	C PAUSE
4	TUNER/LINE
5	CH1
6	CH2
7	CH-1+CH-2
8	GND
9	ATR

To
SYSTEM CONTROL
PG921 VIA
CNW921

PG4710

1	L-CH AUDIO
2	GND
3	R-CH AUDIO

To
TIMER
PG122 VIA
CNW122

PG4711

1	9.5V
2	A12V
3	$\overline{\text{PB}}$12V
4	PB9V
5	A18V
6	GND

To
REGULATOR/
SERVO
PG1154
VIA
CNW1154

PG4712

3	L-CH+R-CH
2	R-CH
1	L-CH

To
AUDIO
PG411 VIA
CNW411

PG4716

1	SYNC
2	fH
3	VERTICAL DRIVE
4	TUNING SELECT

To
V.S TUNING
PG714 VIA
CNW714

PG4718

4	LCH AUDIO
3	GND
2	9.5V
1	RCH AUDIO

To
LEVEL INDICATOR
PG124 VIA
CNW124

PG4719

1	——
2	FRAME ADVANCE

To
SYSTEM CONTROL
PG933 VIA
CNW933

PG4791

7	CLOCK
6	GND
5	A13V
4	40V
3	-20V
2	AC3V
1	AC3V

To
RECTIFIER
PG152 VIA
CNW152

PG4792

5	-30V
4	A5V
3	GND
2	A10V
1	32V

To
V.S TUNING
PG702
VIA
CNW702

PG4793

1	CLOCK
2	40V

To
V.S TUNING
PG704 VIA
CNW704

PG4794

4	AC3V
3	AC3V
2	-20V
1	-25V

To
TIMER
PG104 VIA
CNW104

PG4795

5	B5V
4	A10V
3	CLOCK
2	A5V
1	GND

To
TIMER
PG105
VIA
CNW105

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

Q4709

B	1.7 (1.7)
C	5.3(5.3)
E	1.3(1.3)

Q4710

B	
C	
E	

Q4711

B	0 (0)
C	9.5 (9.5)
E	9.5(9.5)

Q4794

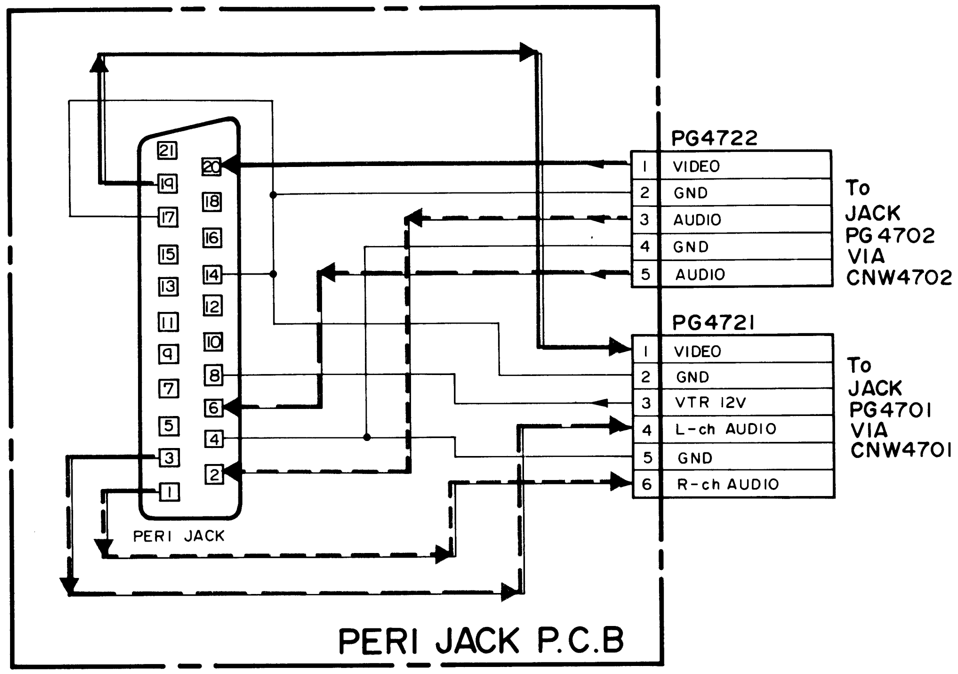
B	6.0(6.0)
C	10.0(10.0)
E	6.0(6.0)

Q4796

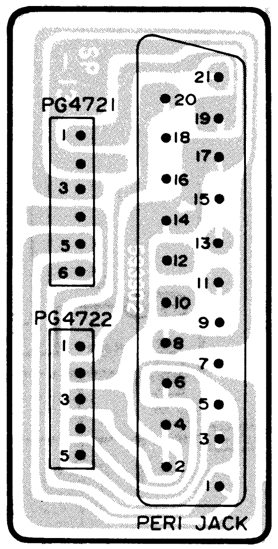
B	-26.5(-26.5)
C	-27(-27)
E	-26(-26)

Q4797

B	-25(-25)
C	-26.5(-26.5)
E	-26.5(-26.5)



21
19
17
15
13
11
9
7
5
3
1
20
18
16
14
12
10
8
6
4
2
PERI JACK
PG4722
1 VIDEO
2 GND
3 AUDIO
4 GND
5 AUDIO
To
JACK
PG4702
VIA
CNW4702
PG4721
1 VIDEO
2 GND
3 VTR 12V
4 L-ch AUDIO
5 GND
6 R-ch AUDIO
To
JACK
PG4701
VIA
CNW4701
PERI JACK P.C.B



PG4721
1
3
5
6
PG4722
1
3
5
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
PERI JACK

PERI JACK P.C.B

SCHEMATIC DIAGRAM GUIDE	PAGE (UK)/(E)
TUNER/IF	58/67
TUNER PACK	61/71
RF BOOSTER	62/70
V.S TUNING	63/73
MPX DEMODULATOR	— 77
JACK	81/85
Y/CHROMA	90/98
FM AUDIO	106/106
LINEAR AUDIO	115/115
OPERATION SW/ TAPE COUNTER DISPLAY	109/109
SYSTEM CONTROL	118/118
REGULATOR/SERVO	125/125
I.R RECEIVER	134/134
TIMER	135/135
RECTIFIER	139/139
RF CONVERTER	141/141

PG4721

1	VIDEO
2	GND
3	VTR 12V
4	L-CH AUDIO
5	GND
6	R-CH AUDIO

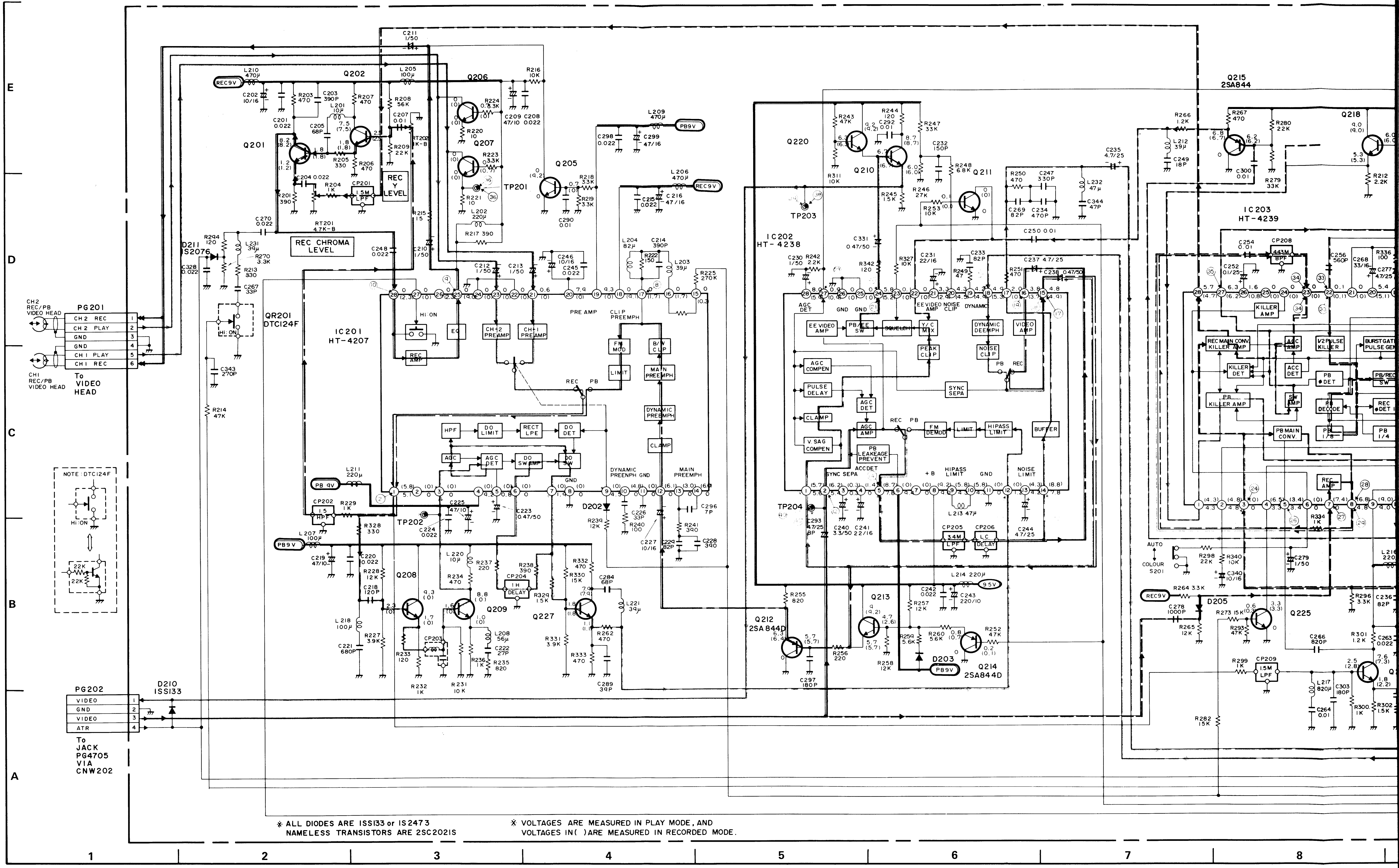
To
JACK
PG4701
VIA
CNW4701

PG4722

1	VIDEO
2	GND
3	R-CH AUDIO
4	GND
5	L-CH AUDIO

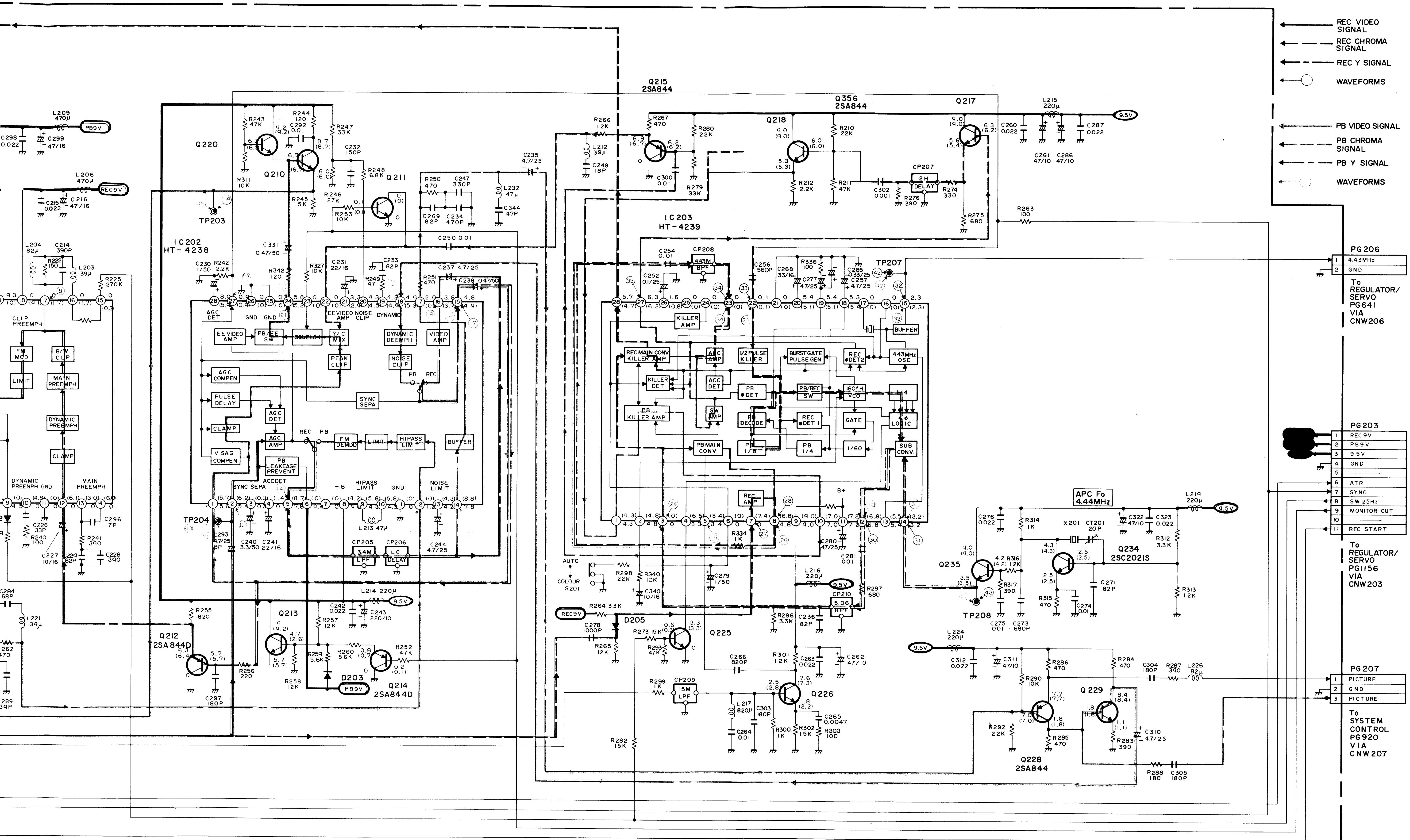
To
JACK
PG4702
VIA
CNW4702

Y/CHROMA [For UK model]


IC201 HT-4207
IC202 HT-4238
IC203 HT-4239
QR201 DTC124F
Q201
Q202
Q205
Q206
Q207
Q208
Q209
Q210
Q211
Q212 2SA844D
Q213
Q214 2SA844D
Q215 2SA844
Q218
Q220
Q225
Q227
D202
D203
D205
D210 1SS133
D211 1S2076
PG201
CH2 REC
CH2 PLAY
GND
GND
CH1 PLAY
CH1 REC
CH2 REC/PB VIDEO HEAD
CH1 REC/PB VIDEO HEAD
To VIDEO HEAD
PG202
VIDEO
GND
VIDEO
ATR
To JACK PG4705 VIA CNW202
NOTE: DTC124F
Hi:ON
REC9V
PB9V
PB 9V
9.5V
REC Y LEVEL
REC CHROMA LEVEL
TP201
TP202
TP203
TP204
CP201 1.5M LPF
CP202 1.5 HPF
CP204 1H DELAY
CP205 3.4M LPF
CP206 LC DELAY
CP208 4.43M BPF
CP209 1.5M LPF
CH-2 PREAMP
CH-1 PREAMP
REC AMP
EQ
FM MOD
LIMIT
B/W CLIP
MAIN PREEMPH
DYNAMIC PREEMPH
CLAMP
HPF
DO LIMIT
RECT LPE
DO DET
AGC
AGC DET
DO SWAMP
DO SW
PRE AMP
CLIP PREEMPH
DYNAMIC PREEMPH GND
MAIN PREEMPH
AGC DET
EE VIDEO AMP
PB/EE SW
SQUELCH
Y/C MIX
PEAK CLIP
DYNAMIC DEEMPH
VIDEO AMP
NOISE CLIP
AGC COMPEN
PULSE DELAY
SYNC SEPA
AGC DET
AGC AMP
FM DEMOD
LIMIT
HIPASS LIMIT
BUFFER
V.SAG COMPEN
PB LEAKEAGE PREVENT
ACC DET
HIPASS LIMIT
NOISE LIMIT
KILLER AMP
REC MAIN CONV. KILLER AMP
KILLER DET
ACC AMP
ACC DET
PB KILLER AMP
SW AMP
V2 PULSE KILLER
BURST GATE PULSE GEN
PB ●DET
PB/REC SW
REC ●DET
PB DECODE
PB MAIN CONV.
PB 1/8
PB 1/4
REC AMP
AUTO
COLOUR
S201
E
D
C
B
A
1
2
3
4
5
6
7
8

※ ALL DIODES ARE 1SS133 or 1S2473
NAMELESS TRANSISTORS ARE 2SC2021S

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND
VOLTAGES IN( )ARE MEASURED IN RECORDED MODE.


REC VIDEO SIGNAL
REC CHROMA SIGNAL
REC Y SIGNAL
WAVEFORMS
PB VIDEO SIGNAL
PB CHROMA SIGNAL
PB Y SIGNAL
WAVEFORMS
IC202 HT-4238
IC203 HT-4239
Q215 2SA844
Q356 2SA844
Q217
Q218
Q220
Q210
Q211
Q212 2SA844D
Q213
Q214 2SA844D
Q225
Q226
Q228 2SA844
Q229
Q234 2SC2021S
Q235
TP203
TP204
TP207
TP208
D203
D205
APC Fo 4.44MHz
PB9V
REC9V
9.5V
AUTO
COLOUR S201
PG206
1 4.43MHz
2 GND
To REGULATOR/ SERVO PG641 VIA CNW206
PG203
1 REC 9V
2 PB 9V
3 9.5V
4 GND
5 ——
6 ATR
7 SYNC
8 SW 25Hz
9 MONITOR CUT
10 ——
11 REC START
To REGULATOR/ SERVO PG1156 VIA CNW203
PG207
1 PICTURE
2 GND
3 PICTURE
To SYSTEM CONTROL PG920 VIA CNW207

ASURED IN PLAY MODE, AND
E MEASURED IN RECORDED MODE.

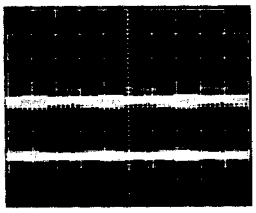
Y/CHROMA P.C.B

4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12

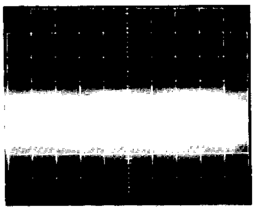
Y/CHROMA CIRCUIT WAVEFORMS

[IC201]

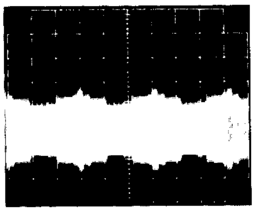
①PIN1 PB
0.5V/20 μs. div.



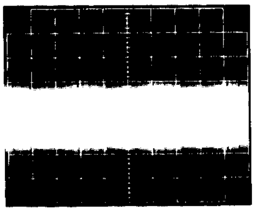
②PIN1 REC
0.2V/20 μs. div.



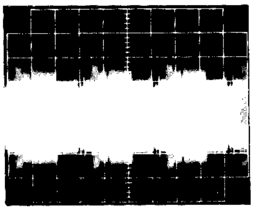
③PIN3 PB
0.1V/20 μs. div.



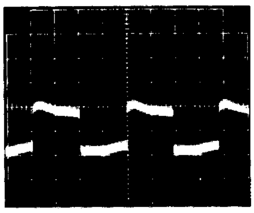
④PIN6 PB
20 mV/20 μs. div.



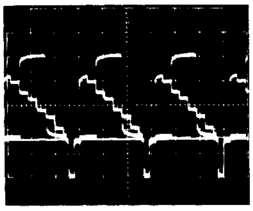
⑤PIN7 PB
0.2V/20 μs. div.



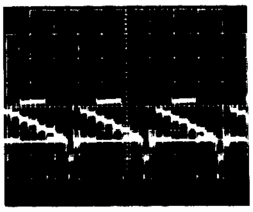
⑥PIN9 PB
20 mV/10 ms. div.



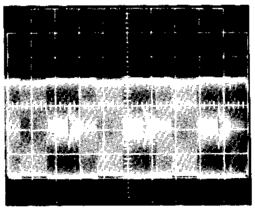
⑦PIN12 REC
0.2V/20 μs. div.



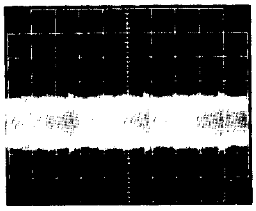
⑧PIN17 REC
0.2V/20 μs. div.



⑨PIN25 REC
1.0V/20 μs. div.

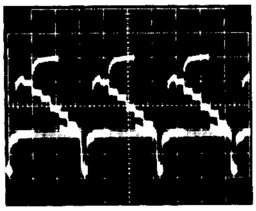


⑩PIN28 REC
50 mV/20 μs. div.

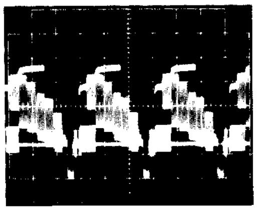


[IC202]

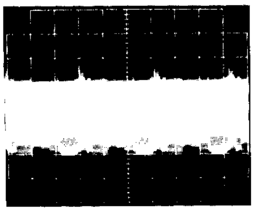
⑪PIN1 PB
0.2 V/20 μs. div.



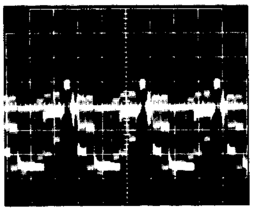
⑫PIN2 REC
0.2V/20 μs. div.



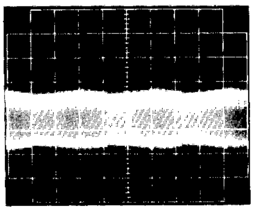
⑬PIN5 PB
1V/20 μs. div.



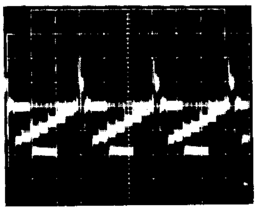
⑭PIN5 REC
0.1V/20 μs. div.



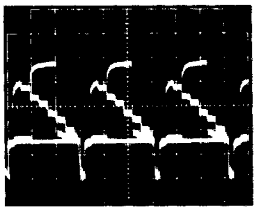
⑮PIN12 PB
0.1V/20 μs. div.



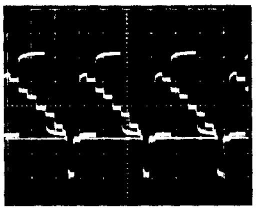
⑯PIN14 PB
0.1V/20 μs. div.



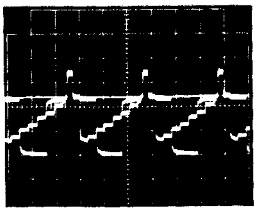
⑰PIN15 REC
0.2V/20 μs. div.



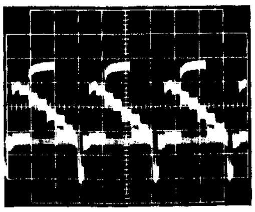
⑱PIN15 PB
0.1V biv./20 μs. div.



⑲PIN16 REC
0.1V/20 μs. div.

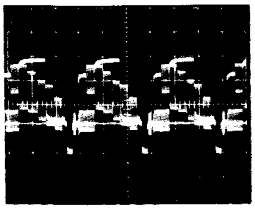


⑳PIN18 PB
0.2V/20 μs. div.

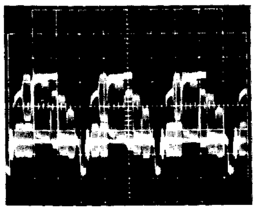


[IC202]

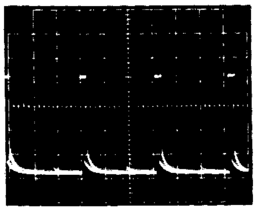
㉑PIN24 REC
0.5V/20 μs. div.



㉒PIN24 PB
0.5V/20 μs. div.

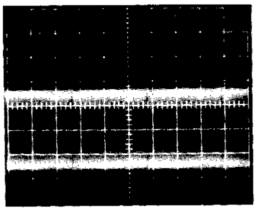


㉓PIN27 PB
2V/20 μs. div.

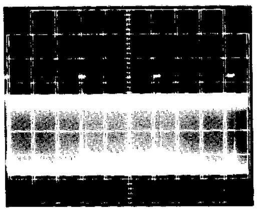


[IC203]

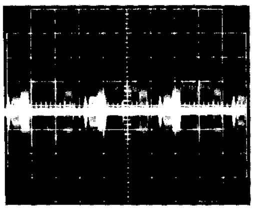
㉔PIN3 REC
50 mV/20 μs. div.



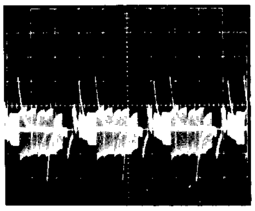
㉕PIN3 PB
0.1V/20 μsec.



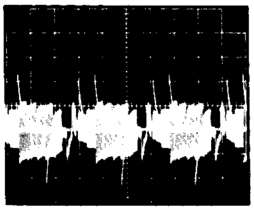
㉖PIN5 PB
0.2V/20 μs. div.



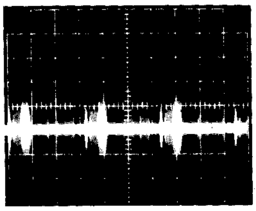
㉗PIN7 REC
0.2V/20 μs. div.



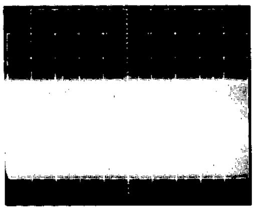
㉘PIN8 REC
0.2V/20 μs. div.



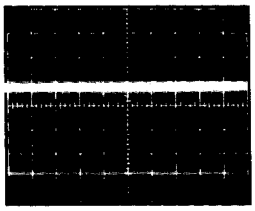
㉙PIN8 PB
0.2V/20 μs. div.



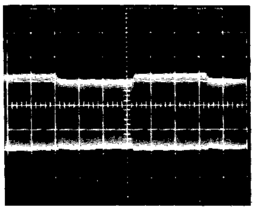
㉚PIN12 PB/REC
0.2V/20 μs. div.



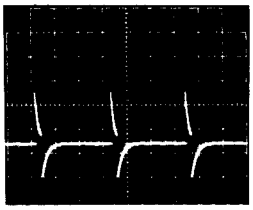
㉛PIN14 PB/REC
0.2V/20 μs. div.



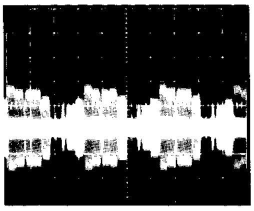
㉜PIN15 PB/REC
50 mV/20 μs. div.



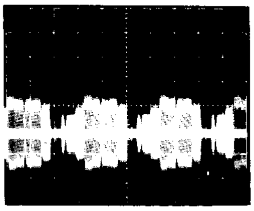
㉝PIN19 PB/REC
50 mV/20 μs. div.



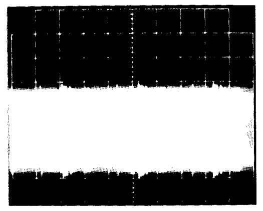
㉞PIN23 REC
50 mV/20 μs. div.

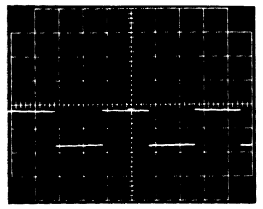


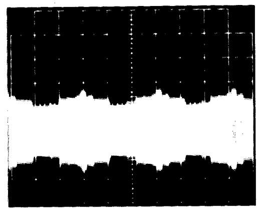
㉟PIN28 REC
0.1V/20 μs. div.

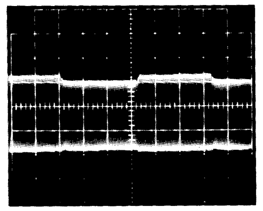


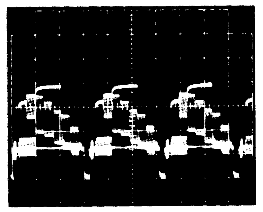
TEST POINTS

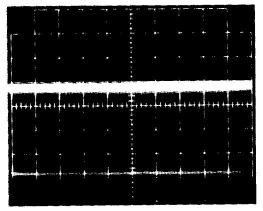

㊱ TP201 PB/REC
50 mV/20 µs. div.

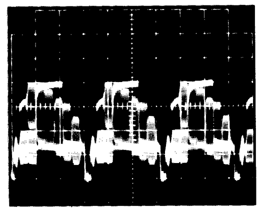

㊶ TP205 PB/REC
5V/10 ms. div.

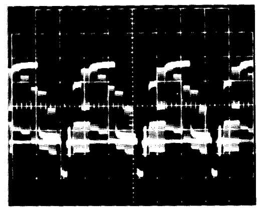

㊲ TP202 PB
0.1V/20 µs. div.


㊷ TP207 PB/REC
50mV/20 µs. div.

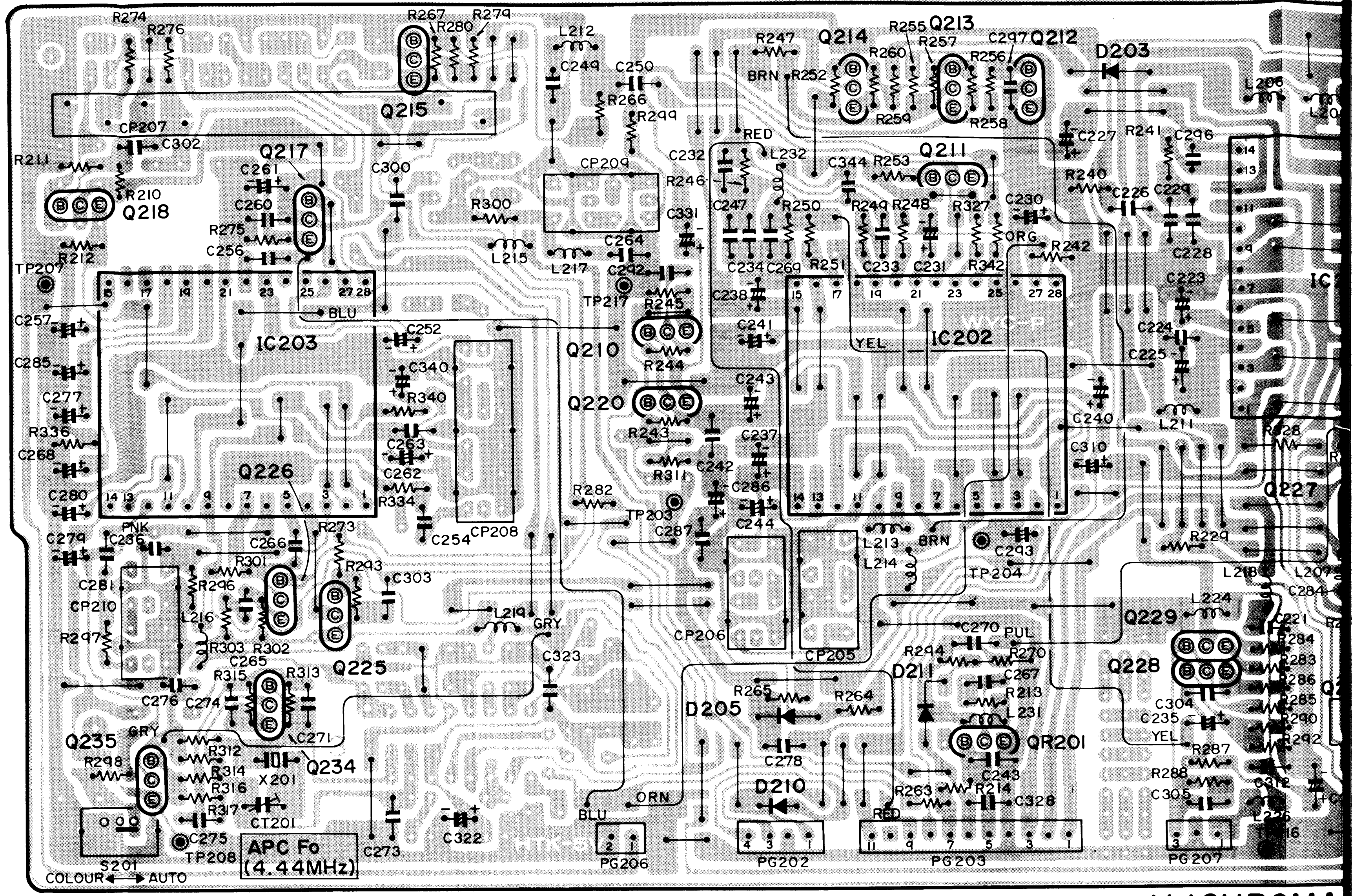

㊳ TP203 REC
0.5V/20 µs. div.


㊸ TP208 PB/REC
0.2V/20 µs. div.


㊴ TP203 PB
0.5V/20 µs. div.


㊵ TP204 REC
0.1V/20 µs. div.

SCHEMATIC DIAGRAM GUIDE	PAGE (UK)/(E)
TUNER/IF	58/67
TUNER PACK	61/71
RF BOOSTER	62/70
V.S TUNING	63/73
MPX DEMODULATOR	— 77
JACK	81/85
Y/CHROMA	90/98
FM AUDIO	106/106
LINEAR AUDIO	115/115
OPERATION SW/ TAPE COUNTER DISPLAY	109/109
SYSTEM CONTROL	118/118
REGULATOR/SERVO	125/125
I.R RECEIVER	134/134
TIMER	135/135
RECTIFIER	139/139
RF CONVERTER	141/141



Q215
Q217
Q218
Q214
Q213
Q212
Q211
Q210
Q220
Q226
Q225
Q234
Q235
Q227
Q228
Q229
QR201
IC203
IC202
D203
D205
D210
D211
TP207
TP217
TP203
TP204
TP208
X201
CT201
S201
COLOUR ↔ AUTO
APC Fo (4.44MHz)
CP205
CP206
CP207
CP208
CP209
CP210
PG206
PG202
PG203
PG207
BLU
GRY
RED
BRN
YEL
ORG
PNK
PUL
ORN

Y/CHROMA

PG201

6	CH1 REC
5	CH1 PLAY
4	GND
3	GND
2	CH2 PLAY
1	CH2 REC

To
VIDEO
HEAD

PG202

1	VIDEO
2	GND
3	VIDEO
4	ATR

To
JACK
PG4705
VIA
CNW202

PG203

1	REC 9V
2	PB 9V
3	9.5V
4	GND
5	—
6	ATR
7	SYNC
8	SW 25Hz
9	MONITOR CUT
10	—
11	REC START

To
REGULATOR/SERVO
PG1156
VIA
CNW203

PG206

1	4.43MHz
2	GND

To
REGULATOR/SERVO
PG641
VIA
CNW206

PG207

1	PICTURE
2	GND
3	PICTURE

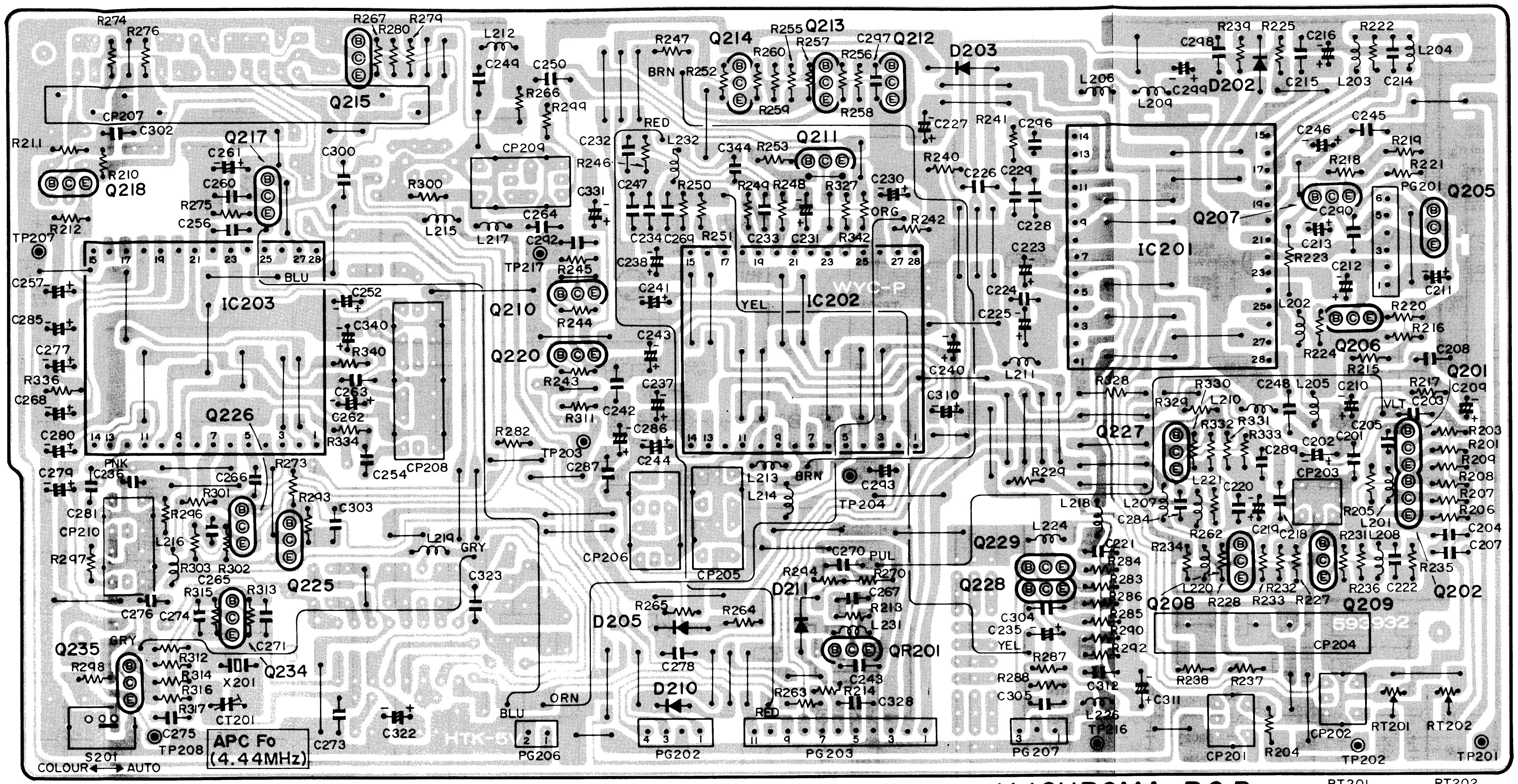
To
SYSTEM
CONTROL
PG920
VIA
CNW207

IC202

15	16	17
4.8(4.9)	3.8(3.7)	2.9(0)
14	13	12
7.8(8.8)	4.2(4.3)	1.2(0)

IC203

15	16	17
2.3(2.3)	0 (0)	0 (0)
14	13	12
3.2(3.2)	5.4(5.5)	6.8(6.8)


IC201
IC202
IC203
WYC-P
Q201
Q202
Q205
Q206
Q207
Q208
Q209
Q210
Q211
Q212
Q213
Q214
Q215
Q217
Q218
Q220
Q225
Q226
Q227
Q228
Q229
Q234
Q235
QR201
D202
D203
D205
D210
D211
CP201
CP202
CP203
CP204
CP205
CP206
CP207
CP208
CP209
CP210
PG202
PG203
PG206
PG207
RT201
RT202
TP201
TP202
TP203
TP204
TP207
TP208
TP216
TP217
S201
COLOUR ←→ AUTO
X201
CT201
APC Fo (4.44MHz)
HTK-5
593932
BLU
RED
YEL
ORG
BRN
GRY
PNK
ORN
PUL
VLT

Y/CHROMA P.C.B

RT201

REC CHROMA LEVEL

RT202

REC Y LEVEL

	Q201	Q202	Q205	Q206
B	1.8(1.8)	2.5(2.5)	0.7(0)	0 (0.7)
C	8.2(8.2)	7.5(7.5)	0 (9.2)	0 (0)
E	1.2(1.2)	1.8(1.8)	0 (0)	0 (0)

	Q207	Q208	Q209	Q210
B	0 (0.7)	2.3(0)	1.6 (0)	6.7(6.7)
C	0 (0)	9.3(0)	8.8 (0)	8.7(8.7)
E	0 (0)	1.7 (0)	1.0 (0)	6.0(6.0)

	Q211	Q212	Q213	Q214
B	0.1(0.1)	5.7(5.7)	4.7(2.6)	0.2(0.1)
C	0 (0)	0 (0)	9 (9.2)	0 (0)
E	0 (0)	6.3(6.4)	5.7(5.7)	0.8(0.7)

	Q215	Q 217	Q218	Q220
B	6.2(6.2)	6.3(6.2)	6.0(6.0)	6.3(6.3)
C	0 (0)	9.0(9.0)	9.0(9.0)	9.2(9.2)
E	6.8(6.7)	5.6(5.4)	5.3(5.3)	6.7(6.6)

	Q225	Q226	Q227	Q228
B	0.6(0.3)	2.5(2.8)	1.8 (1.8)	7.0(7.0)
C	3.3(3.3)	7.6(7.3)	7.9 (7.9)	1.8(1.8)
E	0 (0)	1.8(2.2)	1.1 (1.1)	7.7(7.7)

	Q229	Q234	Q235
B	1.8(1.8)	2.5(2.5)	4.2(4.2)
C	8.4(8.4)	4.3(4.3)	9.0(9.0)
E	1.1(1.1)	2.5(2.5)	3.5(3.5)

QR201

B	0.1(0.1)
C	0 (0)
E	0 (0)

PG201

6	CH1 REC
5	CH1 PLAY
4	GND
3	GND
2	CH2 PLAY
1	CH2 REC

To
VIDEO
HEAD

PG202

1	VIDEO
2	GND
3	VIDEO
4	ATR

To
JACK
PG4705
VIA
CNW202

PG203

1	REC 9V
2	PB 9V
3	9.5V
4	GND
5	——
6	ATR
7	SYNC
8	SW25Hz
9	MONITOR CUT
10	——
11	REC START

To
REGULATOR/SERVO
PG1156
VIA
CNW203

PG206

1	4.43MHz
2	GND

To
REGULATOR/SERVO
PG641
VIA
CNW206

PG207

1	PICTURE
2	GND
3	PICTURE

To
SYSTEM
CONTROL
PG920
VIA
CNW207

IC 202

15	16	17	18	19	20	21	22	23	24	25	26	27	28
4.8(4.9)	3.8(3.7)	2.9(0)	4.9(5.3)	4.2(4.9)	4.3(4.9)	3.3(2.9)	0 (0)	0.1(0)	5.9(5.2)	0 (0)	0 (0)	0.9(0.9)	8.0(5.9)
14	13	12	11	10	9	8	7	6	5	4	3	2	1
7.8(8.8)	4.2(4.3)	1.2 (0)	0 (0)	4.3(5.8)	4.3(5.8)	9.0(9.2)	0 (0)	9.4(0)	7.8(8.7)	0 (1.4)	0.3(0.3)	5.4(6.2)	5.6(5.7)

IC 203

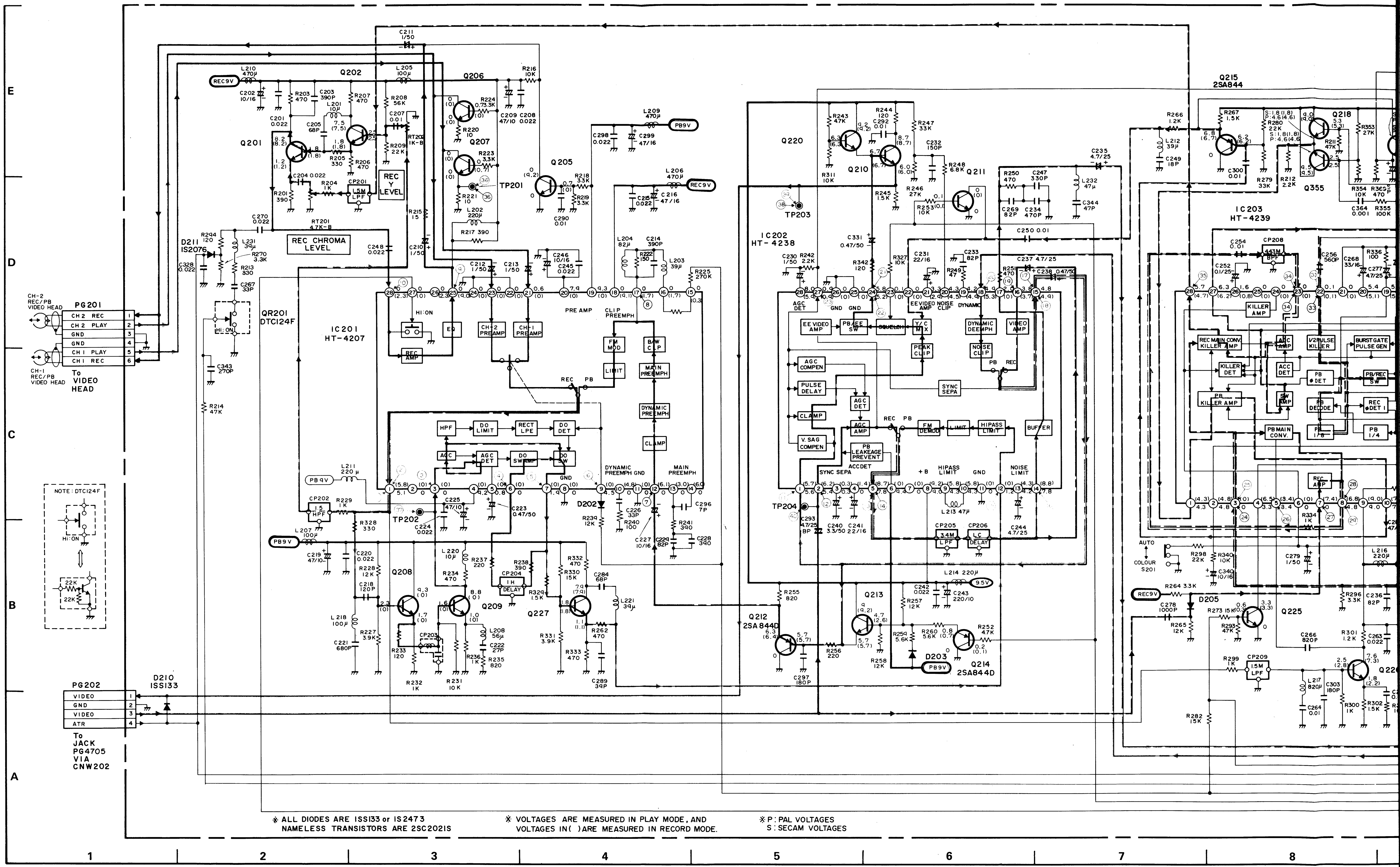
15	16	17	18	19	20	21	22	23	24	25	26	27	28
2.3(2.3)	0 (0)	0 (0)	5.3(5.4)	5.4(5.1)	5.4(5.1)	0 (0)	0.1(0.1)	0 (0)	0 (0)	0 (0)	1.6(0.8)	6.3(6.2)	5.7(4.7)
14	13	12	11	10	9	8	7	6	5	4	3	2	1
3.2(3.2)	5.4(5.5)	6.8(6.8)	7.2(7.2)	7.0(7.0)	9.0(9.0)	4.8(6.8)	0 (7.4)	0 (0)	3.4(3.4)	3.3(6.5)	0 (0)	4.8(4.8)	4.3(4.3)

IC201

14	0 (6.0)	15	0 (0.3)
13	0 (3.0)	16	0 (1.7)
12	0 (6.1)	17	0 (1.7)
11	0 (0)	18	0 (9.1)
10	0 (4.8)	19	9.3 (0)
9	4.5 (0)	20	7.9 (0)
8	0 (0)	21	0.6 (0)
7	1.9 (0)	22	0 (0)
6	0 (0)	23	0.6 (0)
5	0.8 (0)	24	0 (0)
4	9.2 (0)	25	0 (9.2)
3	0 (0)	26	0 (2.3)
2	0 (0)	27	0 (0)
1	5.1(5.8)	28	0 (2.3)

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND
VOLTAGES IN( ) ARE MEASURED IN RECORD MODE.

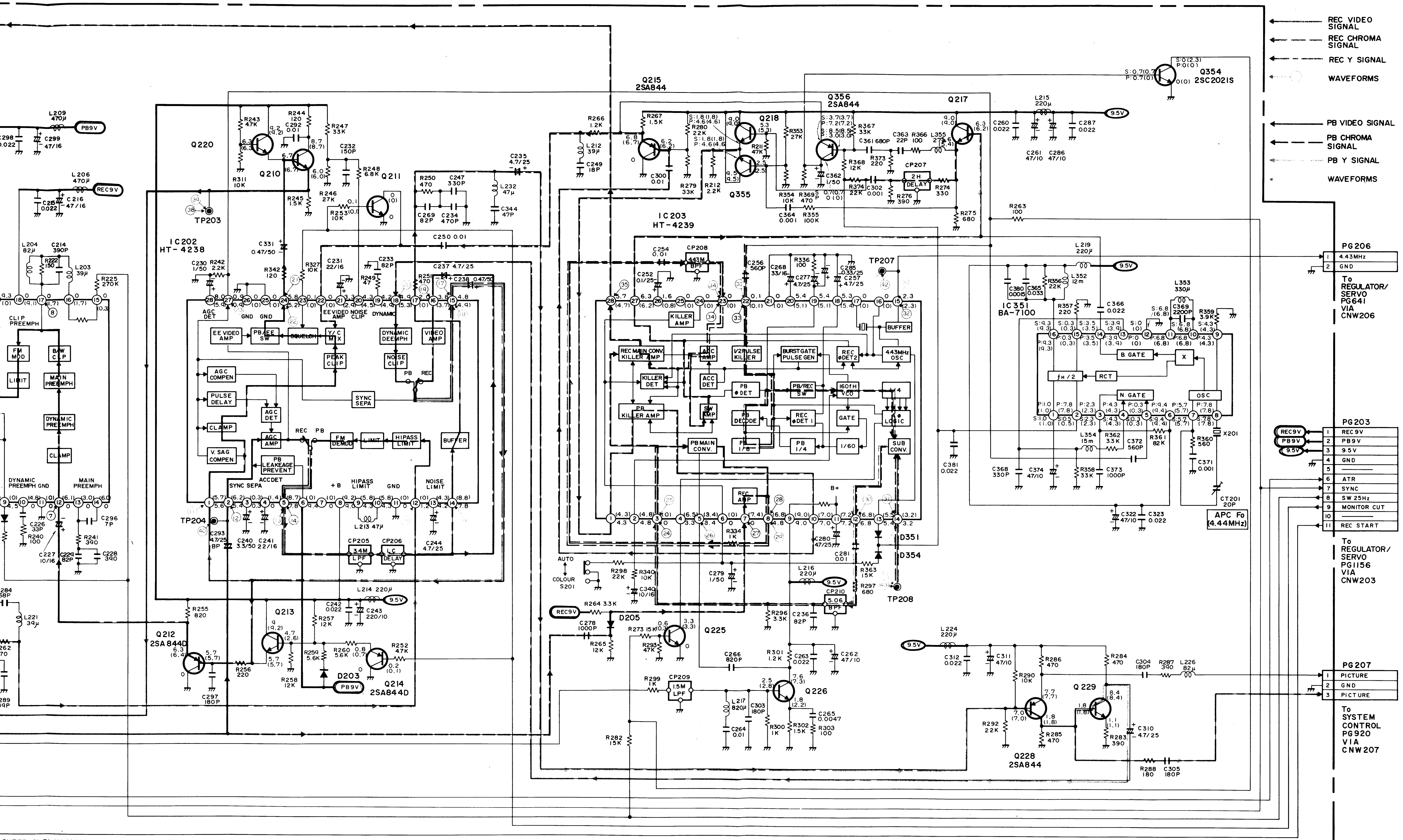
Y/CHROMA [Except for UK model]


PG201
CH-2 REC/PB VIDEO HEAD
CH 2 REC
CH 2 PLAY
GND
GND
CH 1 PLAY
CH 1 REC
CH-1 REC/PB VIDEO HEAD
To VIDEO HEAD
PG202
VIDEO
GND
VIDEO
ATR
To JACK PG4705 VIA CNW202
D210 1SS133
D211 1S2076
NOTE : DTC124F
HI : ON
QR201 DTC124F
IC201 HT-4207
REC CHROMA LEVEL
REC Y LEVEL
Q201
Q202
Q205
Q206
Q207
Q208
Q209
Q227
TP201
TP202
REC9V
PB9V
PRE AMP
CLIP PREEMPH
FM MOD
LIMIT
B/W CLIP
MAIN PREEMPH
DYNAMIC PREEMPH
CLAMP
DYNAMIC PREEMPH GND
MAIN PREEMPH
REC AMP
EQ
CH-2 PREAMP
CH-1 PREAMP
HPF
DO LIMIT
RECT LPE
DO DET
AGC
AGC DET
DO SWAMP
DO SW
1H DELAY
D202
Q220
Q210
Q211
Q212 2SA844D
Q213
Q214 2SA844D
D203
TP203
TP204
IC202 HT-4238
AGC DET
EE VIDEO AMP
PB/EE SW
SQUELCH
Y/C MIX
PEAK CLIP
DYNAMIC DEEMPH
VIDEO AMP
NOISE CLIP
AGC COMPEN
PULSE DELAY
CLAMP
V. SAG COMPEN
SYNC SEPA
FM DEMOD
LIMIT
HIPASS LIMIT
BUFFER
PB LEAKEAGE PREVENT
ACCDET
HIPASS LIMIT
NOISE LIMIT
CP205 3.4M LPF
CP206 LC DELAY
9.5V
Q215 2SA844
Q218
Q355
Q225
IC203 HT-4239
CP208 4.43M BPF
KILLER AMP
REC MAIN CONV KILLER AMP
ACC AMP
V2PULSE KILLER
BURST GATE PULSE GEN
KILLER DET
ACC DET
PB φDET
PB/REC SW
PB KILLER AMP
SW AMP
PB DECODE
REC φDET I
PB MAIN CONV.
PB 1/8
PB 1/4
REC AMP
AUTO
COLOUR
S201
D205
CP209 1.5M LPF
A
B
C
D
E
1
2
3
4
5
6
7
8

※ ALL DIODES ARE 1SS133 or 1S2473
NAMELESS TRANSISTORS ARE 2SC2021S

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND
VOLTAGES IN( )ARE MEASURED IN RECORD MODE.

※ P : PAL VOLTAGES
S : SECAM VOLTAGES


REC VIDEO SIGNAL
REC CHROMA SIGNAL
REC Y SIGNAL
WAVEFORMS
PB VIDEO SIGNAL
PB CHROMA SIGNAL
PB Y SIGNAL
WAVEFORMS
IC202 HT-4238
IC203 HT-4239
IC351 BA-7100
Q210
Q211
Q212 2SA844D
Q213
Q214 2SA844D
Q215 2SA844
Q217
Q218
Q220
Q225
Q226
Q228 2SA844
Q229
Q354 2SC2021S
Q355
Q356 2SA844
TP203
TP204
TP207
TP208
D203
D205
D351
D354
CP205 3.4M LPF
CP206 LC DELAY
CP207 2H DELAY
CP208 4.43M BPF
CP209 1.5M LPF
CP210 5.06 BPF
X201
CT201 20P
APC Fo (4.44MHz)
AUTO
COLOUR S201
EE VIDEO AMP
PB/EE SW
SQUELCH
Y/C MIX
PEAK CLIP
DYNAMIC DEEMPH
NOISE CLIP
VIDEO AMP
AGC COMPEN
PULSE DELAY
AGC DET
CLAMP
AGC AMP
V. SAG COMPEN
PB LEAKEAGE PREVENT
SYNC SEPA
FM DEMOD
LIMIT
HIPASS LIMIT
BUFFER
FM MOD
B&W CLIP
MAIN PREEMPH
DYNAMIC PREEMPH
CLIP PREEMPH
KILLER AMP
REC MAIN CONV KILLER AMP
KILLER DET
PB KILLER AMP
AGC AMP
ACC DET
SW AMP
1/2 PULSE KILLER
PB DET
PB DECODE
BURST GATE PULSE GEN
PB/REC SW
REC DET 1
REC DET 2
160fH VCO
GATE
PB 1/8
PB 1/4
1/60
PB MAIN CONV
REC AMP
4.43MHz OSC
LOGIC
SUB CONV.
B. GATE
N GATE
fH/2
RCT
OSC
PB9V
REC9V
9.5V
PG206
4.43MHz
GND
To REGULATOR/ SERVO PG641 VIA CNW206
PG203
REC 9V
PB9V
9.5V
GND
ATR
SYNC
SW 25Hz
MONITOR CUT
REC START
To REGULATOR/ SERVO PG1156 VIA CNW203
PG207
PICTURE
GND
PICTURE
To SYSTEM CONTROL PG920 VIA CNW207

ASURED IN PLAY MODE, AND
MEASURED IN RECORD MODE.

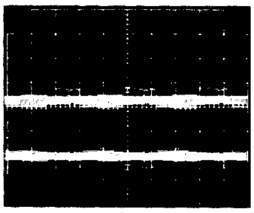
※P: PAL VOLTAGES
S: SECAM VOLTAGES

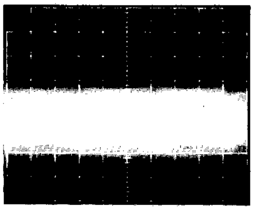
Y/CHROMA P.C.B

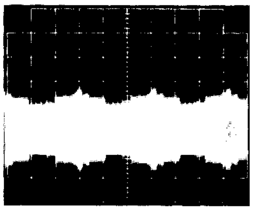
4	5	6	7	8	9	10	11	12

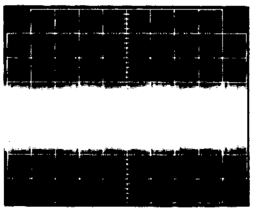
Y/CHROMA CIRCUIT WAVEFORMS

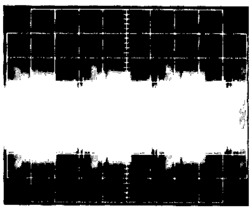
[IC201]

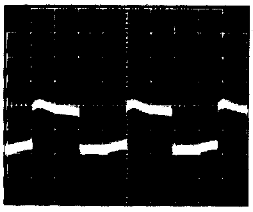

① PIN1 PB
0.5V/20 μs. div.

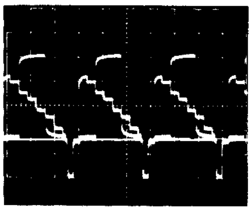

② PIN1 REC
0.2V/20 μs. div.

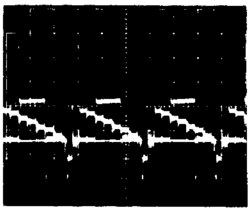

③ PIN3 PB
0.1V/20 μs. div.

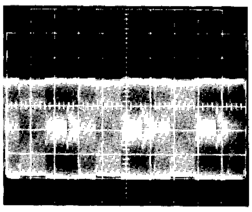

④ PIN6 PB
20 mV/20 μs. div.

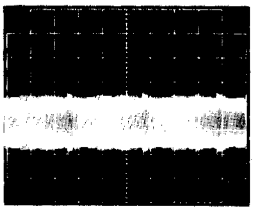

⑤ PIN7 PB
0.2V/20 μs. div.


⑥ PIN9 PB
20 mV/10 ms. div.

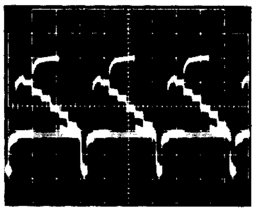

⑦ PIN12 REC
0.2V/20 μs. div.

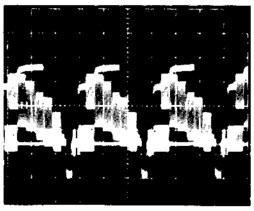

⑧ PIN17 REC
0.2V/20 μs. div.

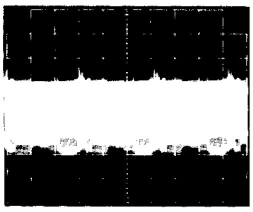

⑨ PIN25 REC
1.0V/20 μs. div.

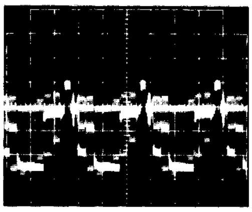

⑩ PIN28 REC
50 mV/20 μs. div.

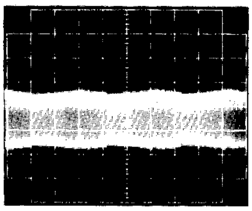
[IC202]

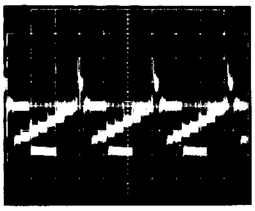

⑪ PIN1 PB
0.2 V/20 μs. div.

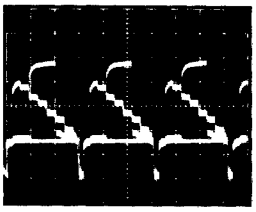

⑫ PIN2 REC
0.2V/20 μs. div.

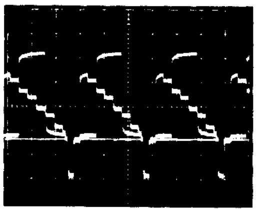

⑬ PIN5 PB
1V/20 μs. div.

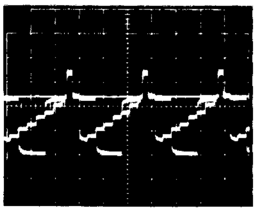

⑭ PIN5 REC
0.1V/20 μs. div.

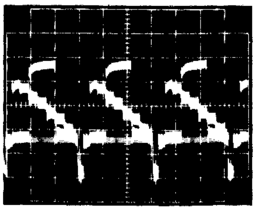

⑮ PIN12 PB
0.1V/20 μs. div.


⑯ PIN14 PB
0.1V/20 μs. div.


⑰ PIN15 REC
0.2V/20 μs. div.

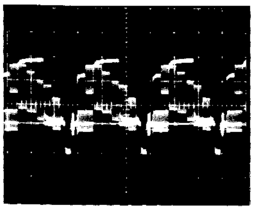

⑱ PIN15 PB
0.1V biv./20 μs. div.


⑲ PIN16 REC
0.1V/20 μs. div.

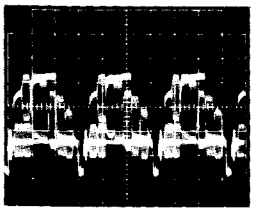

⑳ PIN18 PB
0.2V/20 μs. div.

[IC202]

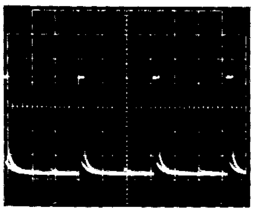
㉑ PIN24 REC
0.5V/20 μs. div.



㉒ PIN24 PB
0.5V/20 μs. div.

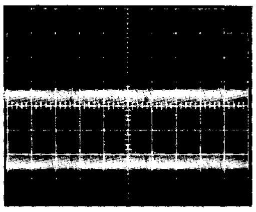


㉓ PIN27 PB
2V/20 μs. div.

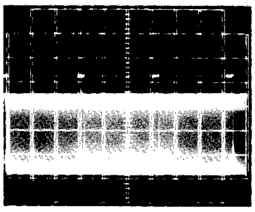


[IC203]

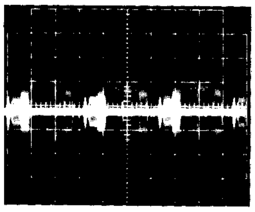
㉔ PIN3 REC
50 mV/20 μs. div.



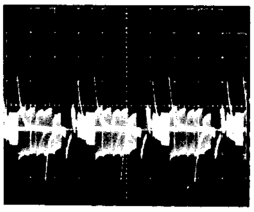
㉕ PIN3 PB
0.1V/20 μsec.



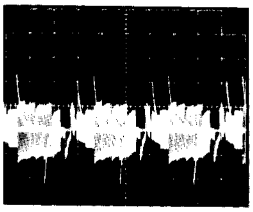
㉖ PIN5 PB
0.2V/20 μs. div.



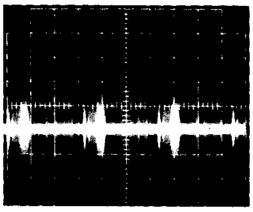
㉗ PIN7 REC
0.2V/20 μs. div.



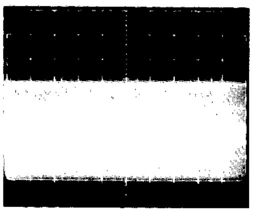
㉘ PIN8 REC
0.2V/20 μs. div.



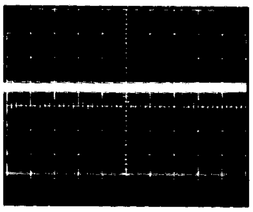
㉙ PIN8 PB
0.2V/20 μs. div.



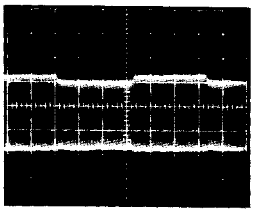
㉚ PIN12 PB/REC
0.2V/20 μs. div.



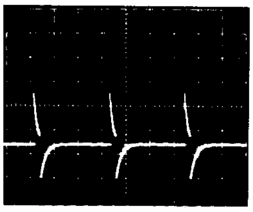
㉛ PIN14 PB/REC
0.2V/20 μs. div.



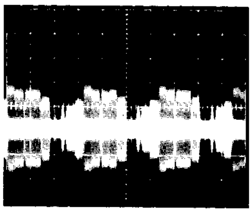
㉜ PIN15 PB/REC
50 mV/20 μs. div.



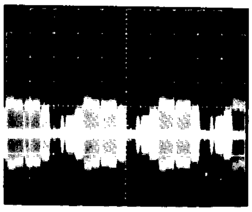
㉝ PIN19 PB/REC
50 mV/20 μs. div.



㉞ PIN23 REC
50 mV/20 μs. div.

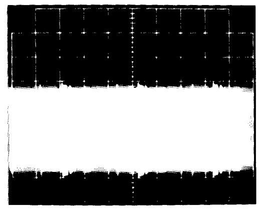


㉟ PIN28 REC
0.1V/20 μs. div.

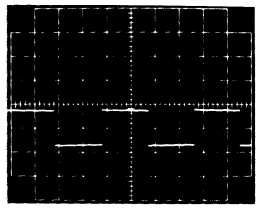


TEST POINTS

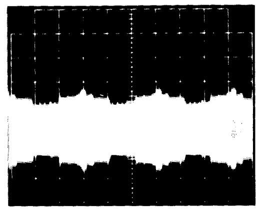
㊱TP201 PB/REC
50 mV/20 μs. div.



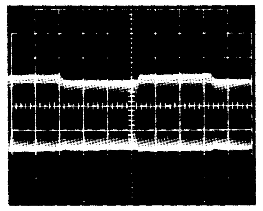
㊶TP205 PB/REC
5V/10 ms. div.



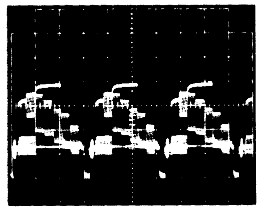
㊲TP202 PB
0.1V/20 μs. div.



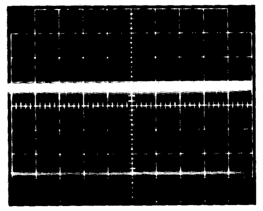
㊷TP207 PB/REC
50mV/20 μs. div.



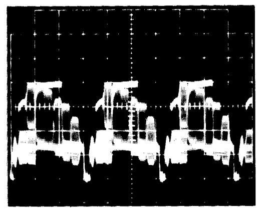
㊳TP203 REC
0.5V/20 μs. div.



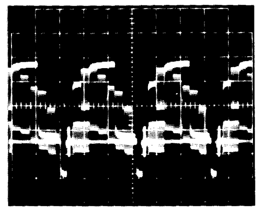
㊸TP208 PB/REC
0.2V/20 μs. div.



㊴TP203 PB
0.5V/20 μs. div.



㊵TP204 REC
0.1V/20 μs. div.



SCHEMATIC DIAGRAM GUIDE	PAGE (UK)/(E)
TUNER/IF	58/67
TUNER PACK	61/71
RF BOOSTER	62/70
V.S TUNING	63/73
MPX DEMODULATOR	– 77
JACK	81/85
Y/CHROMA	90/98
FM AUDIO	106/106
LINEAR AUDIO	115/115
OPERATION SW/ TAPE COUNTER DISPLAY	109/109
SYSTEM CONTROL	118/118
REGULATOR/SERVO	125/125
I.R RECEIVER	134/134
TIMER	135/135
RECTIFIER	139/139
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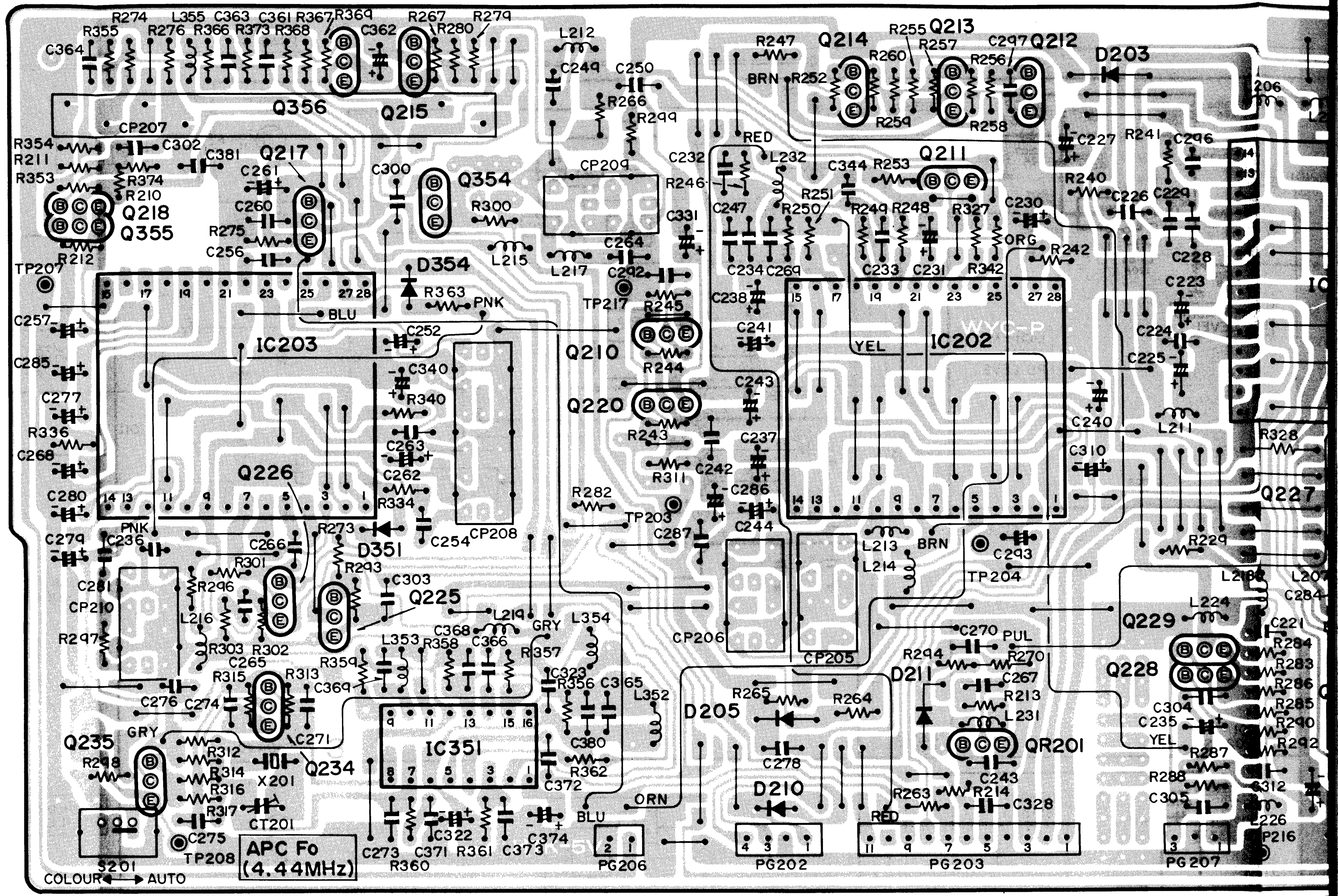

IC203
IC202
IC351
Q356
Q215
Q217
Q354
Q218
Q355
Q214
Q213
Q212
Q211
Q210
Q220
Q226
Q225
Q234
Q235
Q227
Q228
Q229
QR201
D203
D354
D351
D205
D210
D211
TP207
TP217
TP203
TP204
TP208
CP207
CP209
CP208
CP206
CP205
CP210
X201
CT201
APC Fo (4.44MHz)
S201
COLOUR ◀—▶ AUTO
PG206
PG202
PG203
PG207
BLU
PNK
RED
BRN
YEL
GRY
ORN
PUL
ORG

Y/CHROMA

PG201	
6	CH1 REC
5	CH1 PLAY
4	GND
3	GND
2	CH2 PLAY
1	CH2 REC

To
VIDEO
HEAD

PG202	
1	VIDEO
2	GND
3	VIDEO
4	ATR

To
JACK
PG4705
VIA
CNW202

PG203	
1	REC 9V
2	PB 9V
3	9.5V
4	GND
5	—
6	ATR
7	SYNC
8	SW25Hz
9	MONITOR CUT
10	—
11	REC START

To
REGULATOR/SERVO
PG1156
VIA
CNW203

PG206	
1	4.43MHz
2	GND

To
REGULATOR/SERVO
PG641
VIA
CNW206

PG207	
1	PICTURE
2	GND
3	PICTURE

To
SYSTEM
CONTROL
PG920
VIA
CNW207

IC 202

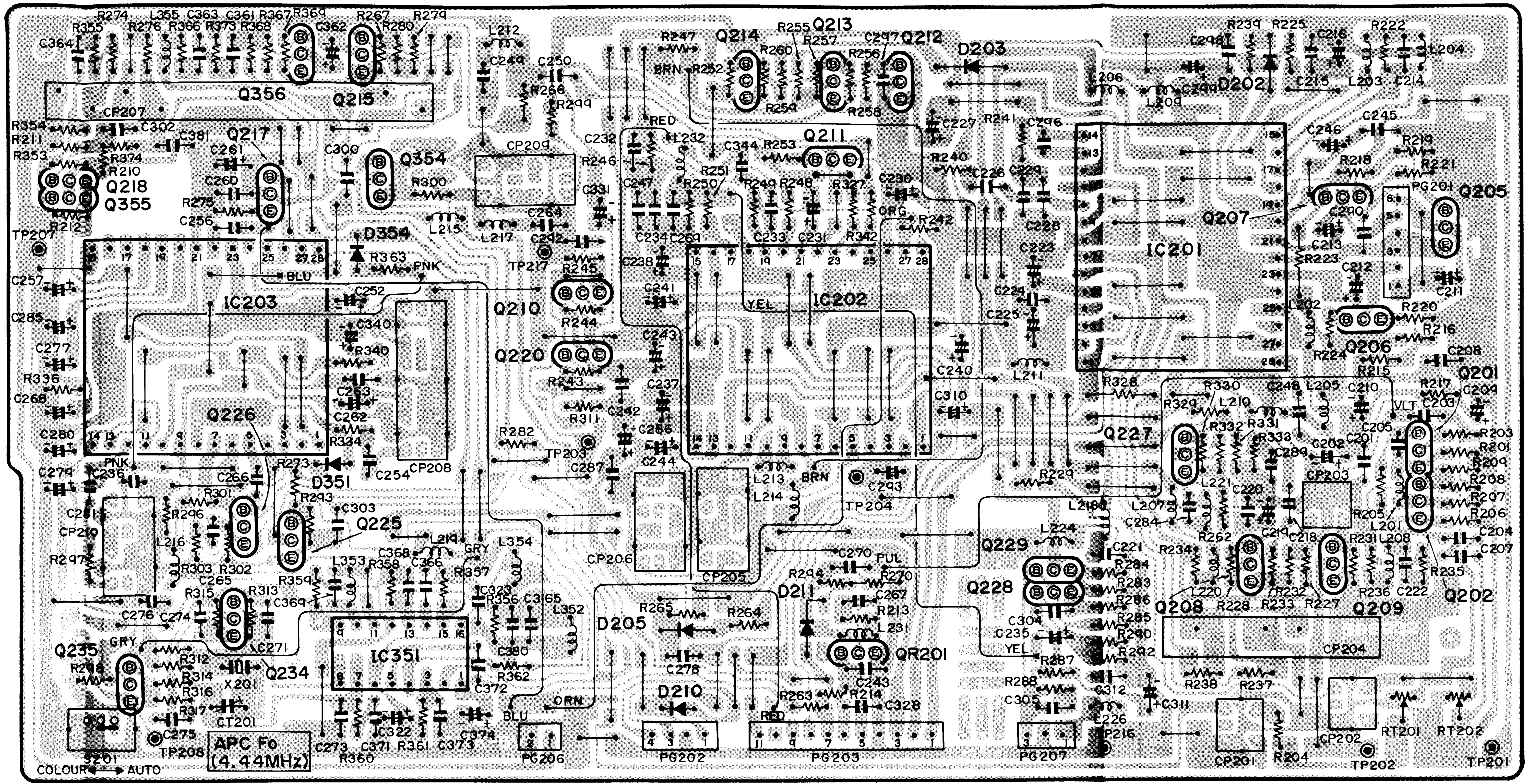
15	16	17
4.8(4.9)	3.8(3.7)	2.9 (0)
14	13	12
7.8(8.8)	4.2(4.3)	1.2 (0)

IC 203

15	16	17
2.3(2.3)	0 (0)	0 (0)
14	13	12
3.2(3.2)	5.4(5.5)	6.8(6.

IC 351

	9	10
PAL	4.3(4.3)	6.8(6.8
SECAM	4.3 (4.3)	6.8(6.8
	8	7
PAL	7.8(7.8)	5.7(5.7
SECAM	7.8(7.8)	5.7(5.7


IC201
IC202
IC203
IC351
Q201
Q202
Q205
Q206
Q207
Q208
Q209
Q210
Q211
Q212
Q213
Q214
Q215
Q217
Q218
Q220
Q225
Q226
Q227
Q228
Q229
Q234
Q235
Q354
Q355
Q356
QR201
D202
D203
D205
D210
D211
D351
D354
X201
CP201
CP202
CP203
CP204
CP205
CP206
CP207
CP208
CP209
CP210
PG201
PG202
PG203
PG206
PG207
TP201
TP202
TP203
TP204
TP207
TP208
TP217
RT201
RT202
APC Fo (4.44MHz)
S201
COLOUR
AUTO

Y/CHROMA P.C.B

RT201	RT202
REC CHROMA LEVEL	REC Y LEVEL

Q201

B	1.8(1.8)
C	8.2(8.2)
E	1.2(1.2)

Q202

B	2.5(2.5)
C	7.5(7.5)
E	1.8(1.8)

Q205

B	0.7(0)
C	0 (9.2)
E	0 (0)

Q206

B	0 (0.7)
C	0 (0)
E	0 (0)

Q207

B	0 (0.7)
C	0 (0)
E	0 (0)

Q208

B	2.3(0)
C	9.3(0)
E	1.7(0)

Q209

B	1.6 (0)
C	8.8 (0)
E	1.0 (0)

Q210

B	6.7(6.7)
C	8.7(8.7)
E	6.0(6.0)

Q211

B	0.1(0.1)
C	0 (0)
E	0 (0)

Q212

B	5.7(5.7)
C	0 (0)
E	6.3(6.4)

Q213

B	4.7(2.6)
C	9 (9.2)
E	5.7(5.7)

Q214

B	0.2(0.1)
C	0 (0)
E	0.8(0.7)

Q215

B	6.2(6.2)
C	0 (0)
E	6.8(6.7)

Q217

B	6.3(6.2)
C	9.0(9.0)
E	5.6(5.4)

Q218

B	5.3(5.3)
C	9.0(9.0)
E	SECAM: 1.8(1.8) PAL: 4.6(4.6)

Q220

B	6.3(6.3)
C	9.2(9.2)
E	6.7(6.6)

Q225

B	0.6(0.3)
C	3.3(3.3)
E	0 (0)

Q226

B	2.5(2.8)
C	7.6(7.3)
E	1.8(2.2)

Q227

B	1.8 (1.8)
C	7.9(7.9)
E	1.1 (1.1)

Q228

B	7.0(7.0)
C	1.8(1.8)
E	7.7(7.7)

Q229

B	1.8(1.8)
C	8.4(8.4)
E	1.1(1.1)

Q354

B	SECAM: 0.7(0.7) PAL : 0.7(0)
C	SECAM: 0 (2.3) PAL : 0 (0)
E	0 (0)

Q355

B	2.5(2.5)
C	9.5(9.5)
E	SECAM : 1.8(1.8) PAL : 4.6(4.6)

Q356

	SECAM	PAL
B	8.5(8.5)	3.0(3.0)
C	0.7(0.7)	0 (0)
E	3.7(3.7)	7.2(7.2)

QR201

B	0.1(0.1)
C	0 (0)
E	0 (0)

PG201

6	CH1 REC
5	CH1 PLAY
4	GND
3	GND
2	CH2 PLAY
1	CH2 REC

To
VIDEO
HEAD

PG202

1	VIDEO
2	GND
3	VIDEO
4	ATR

To
JACK
PG4705
VIA
CNW202

PG203

1	REC 9V
2	PB 9V
3	9.5V
4	GND
5	—
6	ATR
7	SYNC
8	SW25Hz
9	MONITOR CUT
10	—
11	REC START

To
REGULATOR/SERVO
PG1156
VIA
CNW203

PG206

1	4.43MHz
2	GND

To
REGULATOR/SERVO
PG641
VIA
CNW206

PG207

1	PICTURE
2	GND
3	PICTURE

To
SYSTEM
CONTROL
PG920
VIA
CNW207

IC202

15	16	17	18	19	20	21	22	23	24	25	26	27	28
4.8(4.9)	3.8(3.7)	2.9(0)	4.9(5.3)	4.2(4.9)	4.3(4.9)	3.3(2.9)	0 (0)	0.1(0)	5.9(5.2)	0 (0)	0 (0)	0.9(0.9)	8.0(5.9)
14	13	12	11	10	9	8	7	6	5	4	3	2	1
7.8(8.8)	4.2(4.3)	1.2(0)	0 (0)	4.3(5.8)	4.3(5.8)	9.0(9.2)	0 (0)	9.4(0)	7.8(8.7)	0 (1.4)	0.3(0.3)	5.4(6.2)	5.6(5.7)

IC203

15	16	17	18	19	20	21	22	23	24	25	26	27	28
2.3(2.3)	0 (0)	0 (0)	5.3(5.4)	5.4(5.1)	5.4(5.1)	0 (0)	0.1(0.1)	0 (0)	0 (0)	0 (0)	1.6(0.8)	6.3(6.2)	5.7(4.7)
14	13	12	11	10	9	8	7	6	5	4	3	2	1
3.2(3.2)	5.4(5.5)	6.8(6.8)	7.2(7.2)	7.0(7.0)	9.0(9.0)	4.8(6.8)	0 (7.4)	0 (0)	3.4(3.4)	3.3(6.5)	0 (0)	4.8(4.8)	4.3(4.3)

IC351

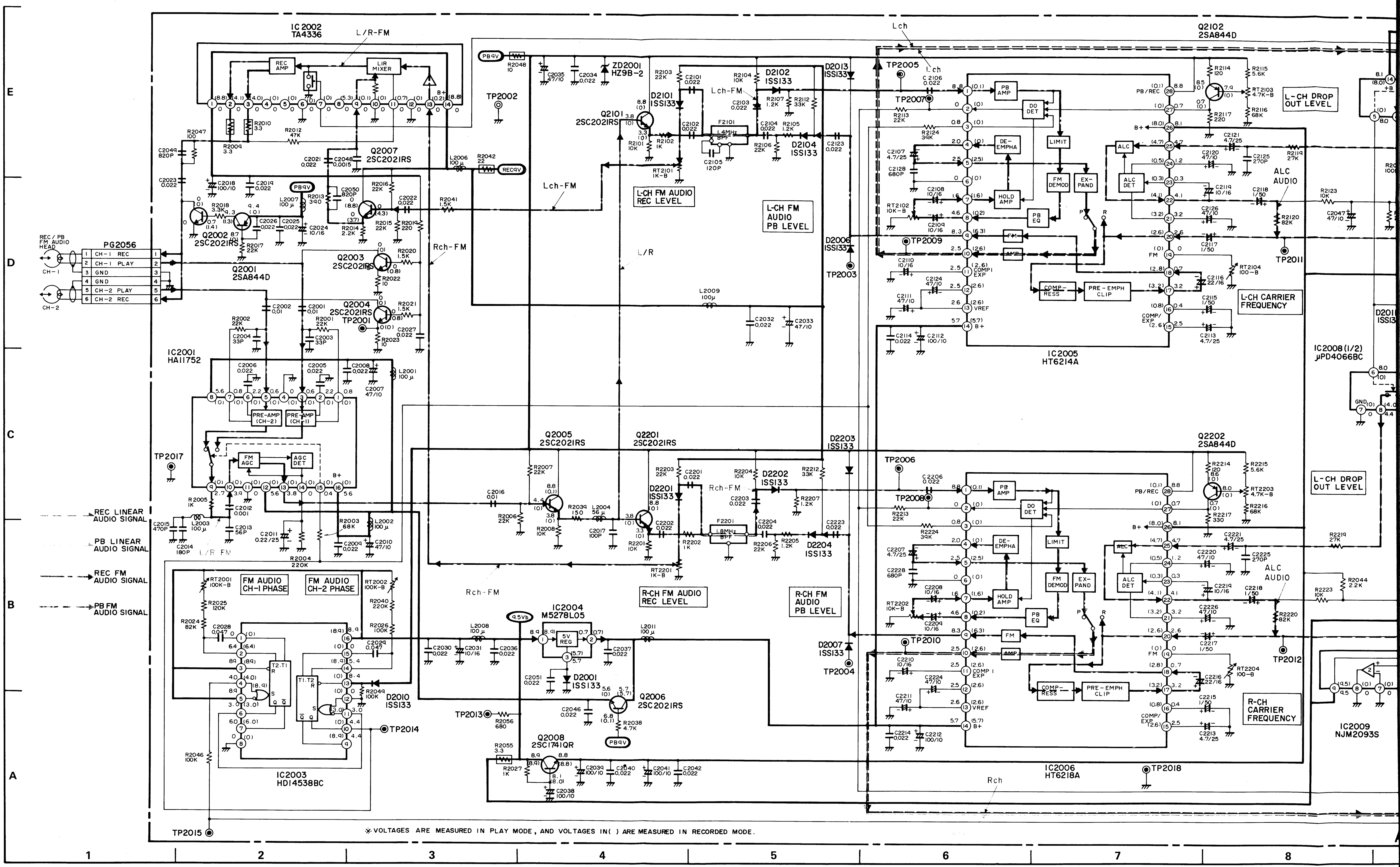
	9	10	11	12	13	14	15	16
PAL	4.3(4.3)	6.8(6.8)	6.8(6.8)	0 (0)	3.9(3.9)	3.5 (3.5)	0.3(0.3)	9.3(9.3)
SECAM	4.3 (4.3)	6.8 (6.8)	6.8 (6.8)	0 (0)	3.9 (3.9)	3.5 (3.5)	0.3(0.3)	9.3(9.3)
	8	7	6	5	4	3	2	1
PAL	7.8(7.8)	5.7(5.7)	9.4(9.4)	0.3 (0.3)	4.3 (4.3)	2.3 (2.3)	7.8(7.8)	1.0(1.0)
SECAM	7.8(7.8)	5.7 (5.7)	9.4(9.4)	0.3 (0.3)	4.3 (4.3)	2.3(2.3)	0.5(0.5)	1.0 (1.0)

IC201

14	0 (6.0)	15	0 (0.3)
13	0 (3.0)	16	0(1.7)
12	0 (6.1)	17	0(1.7)
11	0 (0)	18	0(9.1)
10	0 (4.8)	19	9.3(0)
9	4.5(0)	20	7.9(0)
8	0 (0)	21	0.6(0)
7	1.9(0)	22	0 (0)
6	0 (0)	23	0.6(0)
5	0.8(0)	24	0 (0)
4	9.2(0)	25	0(9.2)
3	0 (0)	26	0(2.3)
2	0 (0)	27	0(0)
1	5.1(5.8)	28	0(2.3)

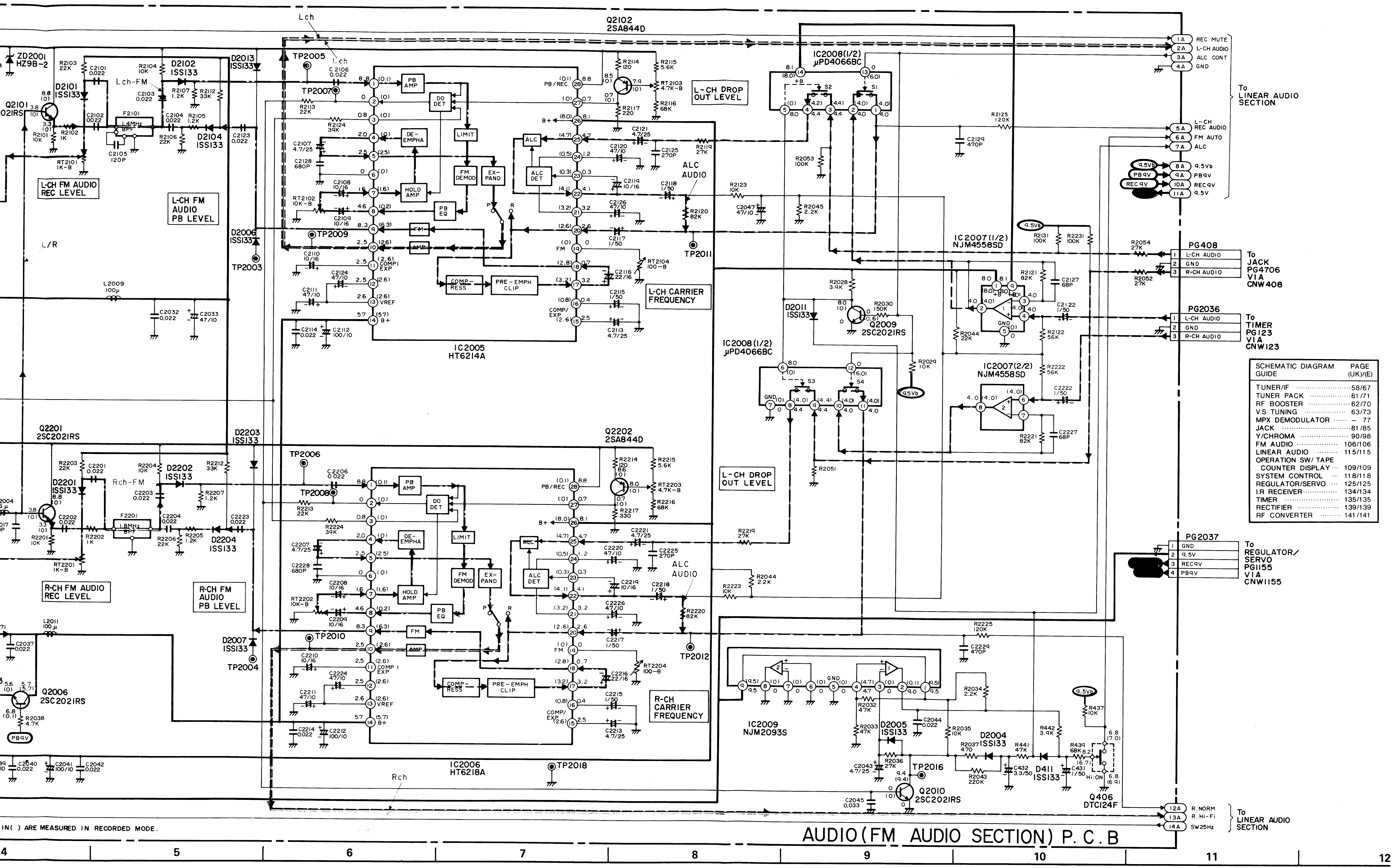
※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

AUDIO [FM AUDIO SECTION]



IC2002 TA4336
L/R-FM
REC AMP
L/R MIXER
PG2056
1 CH-1 REC
2 CH-1 PLAY
3 GND
4 GND
5 CH-2 PLAY
6 CH-2 REC
REC/PB FM AUDIO HEAD
CH-1
CH-2
Q2002 2SC2021RS
Q2001 2SA844D
Q2007 2SC2021RS
Q2003 2SC2021RS
Q2004 2SC2021RS
TP2001
TP2002
PB9V
REC9V
Lch-FM
Rch-FM
L/R
ZD2001 HZ9B-2
Q2101 2SC2021RS
D2101 1SS133
D2102 1SS133
D2104 1SS133
D2013 1SS133
F2101 1.4MHz BPF
L-CH FM AUDIO REC LEVEL
L-CH FM AUDIO PB LEVEL
D2006 1SS133
TP2003
TP2005
TP2007
TP2009
Lch
IC2005 HT6214A
PB AMP
DO DET
DE-EMPHA
LIMIT
FM DEMOD
EX-PAND
HOLD AMP
PB EQ
FM
AMP
COMP-RESS
PRE-EMPH CLIP
ALC
ALC DET
PB/REC
COMP I EXP
VREF
COMP/EXP
Q2102 2SA844D
L-CH DROP OUT LEVEL
ALC AUDIO
L-CH CARRIER FREQUENCY
TP2011
IC2008 (1/2) μPD4066BC
IC2001 HA11752
PRE-AMP (CH-2)
PRE-AMP (CH-1)
FM AGC
AGC DET
TP2017
REC LINEAR AUDIO SIGNAL
PB LINEAR AUDIO SIGNAL
REC FM AUDIO SIGNAL
PB FM AUDIO SIGNAL
FM AUDIO CH-1 PHASE
FM AUDIO CH-2 PHASE
IC2003 HD14538BC
D2010 1SS133
TP2013
TP2014
TP2015
Q2005 2SC2021RS
Q2201 2SC2021RS
D2201 1SS133
D2202 1SS133
D2204 1SS133
D2203 1SS133
D2007 1SS133
F2201 1.8MHz BPF
R-CH FM AUDIO REC LEVEL
R-CH FM AUDIO PB LEVEL
TP2004
TP2006
TP2008
TP2010
TP2012
TP2018
IC2004 M5278L05
5V REG
9.5Vb
D2001 1SS133
Q2006 2SC2021RS
Q2008 2SC1741QR
IC2006 HT6218A
Q2202 2SA844D
L-CH DROP OUT LEVEL
R-CH CARRIER FREQUENCY
Rch
IC2009 NJM2093S
A
B
C
D
E
1
2
3
4
5
6
7
8

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN( ) ARE MEASURED IN RECORDED MODE.


Lch
Q2102
2SA844D
ZD2001
HZ9B-2
Q2101
2SC202IRS
D2101
ISS133
D2102
ISS133
D2104
ISS133
D2013
ISS133
F2101
L4MHz BPF
Lch-FM
TP2005
TP2007
TP2009
TP2003
D2006
ISS133
L-CH FM AUDIO
REC LEVEL
L-CH FM
AUDIO
PB LEVEL
L/R
L2009
100μ
PB AMP
DO DET
DE-EMPHA
LIMIT
FM DEMOD
EX-PAND
HOLD AMP
PB EQ
FM
AMP
COMP-RESS
PRE-EMPH CLIP
ALC
ALC DET
PB/REC
B+
COMP I EXP
VREF
COMP/EXP
IC2005
HT6214A
L-CH DROP
OUT LEVEL
ALC
AUDIO
TP2011
L-CH CARRIER
FREQUENCY
IC2008(1/2)
μPD4066BC
S1
S2
S3
S4
D2011
ISS133
Q2009
2SC202IRS
IC2007(1/2)
NJM4558SD
IC2007(2/2)
NJM4558SD
1A REC MUTE
2A L-CH AUDIO
3A ALC CONT
4A GND
To
LINEAR AUDIO
SECTION
5A L-CH REC AUDIO
6A FM AUTO
7A ALC
8A 9.5Vb
9A PB9V
10A REC9V
11A 9.5V
PG408
1 L-CH AUDIO
2 GND
3 R-CH AUDIO
To
JACK
PG4706
VIA
CNW408
PG2036
1 L-CH AUDIO
2 GND
3 R-CH AUDIO
To
TIMER
PG123
VIA
CNW123
Q2201
2SC202IRS
D2201
ISS133
D2202
ISS133
D2204
ISS133
D2203
ISS133
F2201
1.8MHz BPF
Rch-FM
TP2006
TP2008
TP2010
TP2004
D2007
ISS133
R-CH FM AUDIO
REC LEVEL
R-CH FM
AUDIO
PB LEVEL
Q2202
2SA844D
L-CH DROP
OUT LEVEL
TP2012
R-CH CARRIER
FREQUENCY
IC2006
HT6218A
TP2018
Rch
Q2006
2SC202IRS
PB9V
L2011
100μ
IC2009
NJM2093S
D2005
ISS133
D2004
ISS133
D411
ISS133
Q2010
2SC202IRS
TP2016
Q406
DTC124F
Hi:ON
PG2037
1 GND
2 9.5V
3 REC9V
4 PB9V
To
REGULATOR/
SERVO
PG1155
VIA
CNW1155
12A R.NORM
13A R.Hi-Fi
14A SW25Hz
To
LINEAR AUDIO
SECTION
4
5
6
7
8
9
10
11
12

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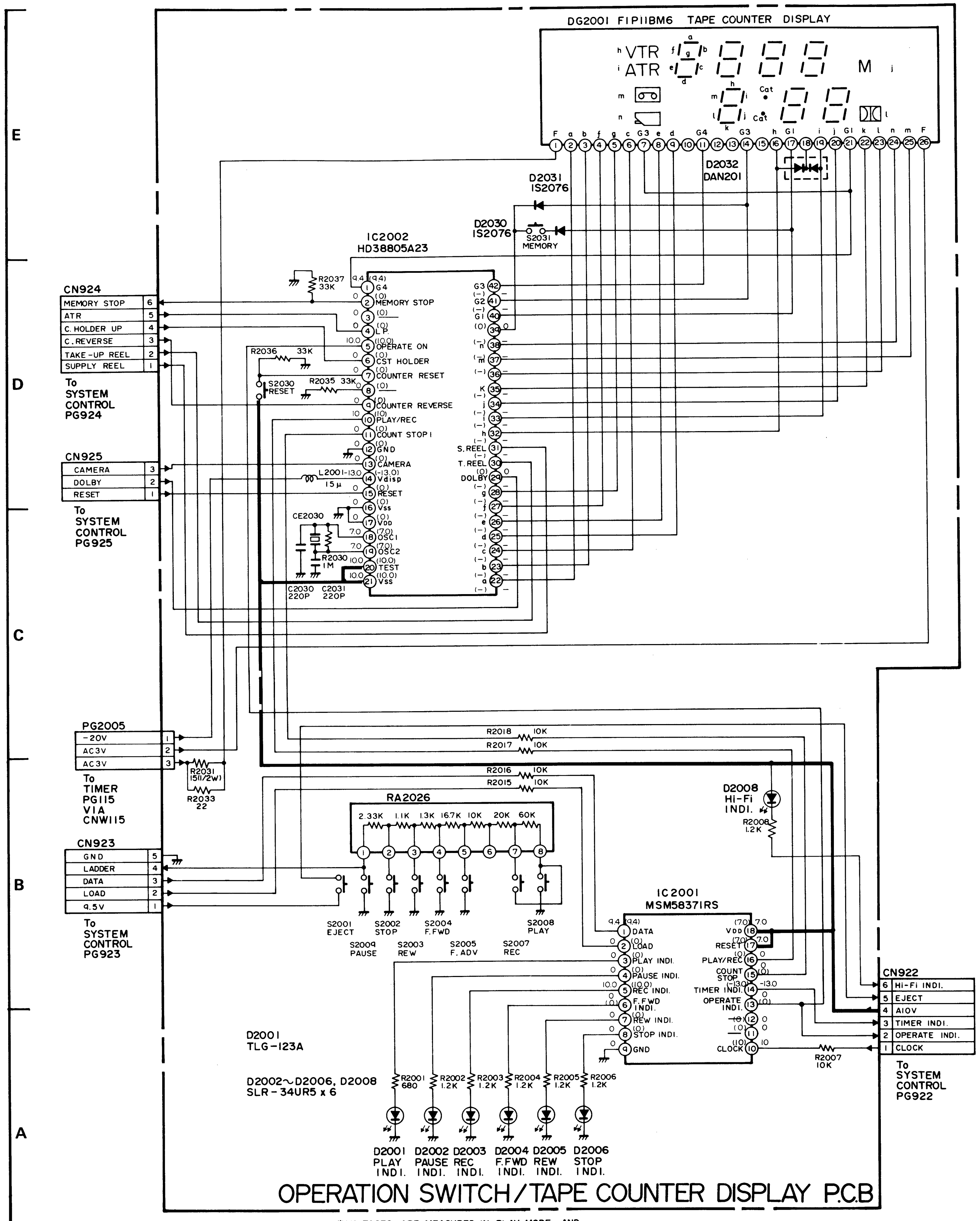
I.R RECEIVER	134/134
TIMER	135/135
RECTIFIER	139/139
RF CONVERTER	141/141

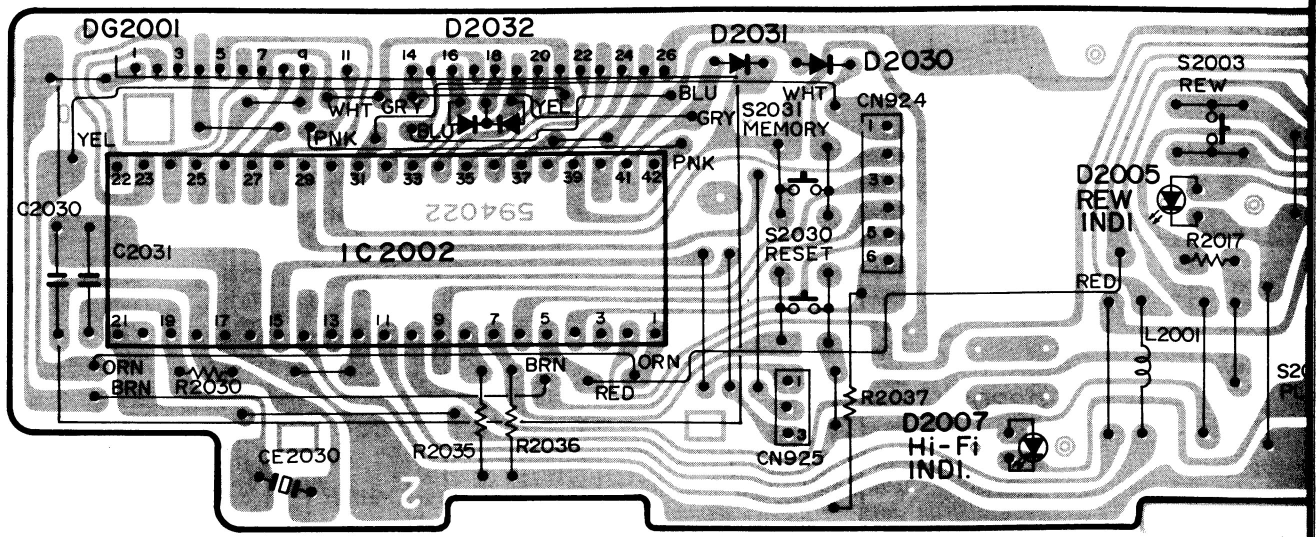
IN( ) ARE MEASURED IN RECORDED MODE.

AUDIO(FM AUDIO SECTION) P.C.B

OPERATION SWITCH/TAPE COUNTER DISPLAY


DG2001 FIP11BM6 TAPE COUNTER DISPLAY
VTR
ATR
M
D2031 1S2076
D2030 1S2076
S2031 MEMORY
D2032 DAN201
IC2002 HD38805A23
R2037 33K
MEMORY STOP
L.P
OPERATE ON
CST HOLDER
COUNTER RESET
COUNTER REVERSE
PLAY/REC
COUNT STOP I
GND
CAMERA
Vdisp
RESET
Vss
VDD
OSC1
OSC2
TEST
S.REEL
T.REEL
DOLBY
R2036 33K
R2035 33K
S2030 RESET
L2001 15μ
CE2030
R2030 1M
C2030 220P
C2031 220P
CN924
MEMORY STOP
ATR
C.HOLDER UP
C.REVERSE
TAKE-UP REEL
SUPPLY REEL
To SYSTEM CONTROL PG924
CN925
CAMERA
DOLBY
RESET
To SYSTEM CONTROL PG925
PG2005
-20V
AC3V
AC3V
To TIMER PG115 VIA CNW115
R2031 15Ω(1/2W)
R2033 22
R2018 10K
R2017 10K
R2016 10K
R2015 10K
RA2026
2.33K 1.1K 1.3K 16.7K 10K 20K 60K
D2008 Hi-Fi INDI.
R2008 1.2K
CN923
GND
LADDER
DATA
LOAD
9.5V
To SYSTEM CONTROL PG923
S2001 EJECT
S2002 STOP
S2004 F.FWD
S2008 PLAY
S2009 PAUSE
S2003 REW
S2005 F.ADV
S2007 REC
IC2001 MSM58371RS
DATA
LOAD
PLAY INDI.
PAUSE INDI.
REC INDI.
F.FWD INDI.
REW INDI.
STOP INDI.
GND
VDD
RESET
PLAY/REC
COUNT STOP
TIMER INDI.
OPERATE INDI.
CLOCK
R2007 10K
CN922
Hi-Fi INDI.
EJECT
A10V
TIMER INDI.
OPERATE INDI.
CLOCK
To SYSTEM CONTROL PG922
D2001 TLG-123A
D2002~D2006, D2008 SLR-34UR5 x 6
R2001 680
R2002 1.2K
R2003 1.2K
R2004 1.2K
R2005 1.2K
R2006 1.2K
D2001 PLAY INDI.
D2002 PAUSE INDI.
D2003 REC INDI.
D2004 F.FWD INDI.
D2005 REW INDI.
D2006 STOP INDI.
OPERATION SWITCH/TAPE COUNTER DISPLAY P.C.B
A
B
C
D
E

※VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.


DG2001
D2032
D2031
D2030
S2003 REW
WHT
GRY
PNK
BLU
YEL
S2031 MEMORY
CN924
D2005 REW INDI
R2017
C2030
C2031
IC2002
594022
S2030 RESET
RED
L2001
ORN
BRN
R2030
R2037
D2007 Hi-Fi INDI.
CE2030
R2035
R2036
CN925

OPER

IC 2001

10	11	12	13	14	15	16	17	18
10 (10)	0 (0)	0 (0)	0 (0)	-13.0(-13.0)	0 (0)	0 (0)	7.0 (7.0)	7.0 (7.0)
9	8	7	6	5	4	3	2	1
0 (0)	0 (0)	0 (0)	0 (0)	10.0 (10.0)	0 (0)	0 (0)	0 (0)	9.4 (9.4)

PG2005

1	-20V
2	AC 3V
3	AC 3V

To
TIMER
PG115
VIA
CNW115

IC 2002

22	23	24	25	26	27	28	29	30	31	32	33	34	35
—	—	—	—	—	—	—	0 (0)	—	—	—	—	—	—
21	20	19	18	17	16	15	14	13	12	11	10	9	8
10.0 (10.0)	10.0(10.0)	7.0 (7.0)	7.0 (7.0)	0 (0)	0 (0)	0 (0)	-13.0(-13.0)	0 (0)	0 (0)	0 (0)	10 (10)	0 (0)	0 (0)

※VOLTAGES ARE MEAS
VOLTAGES IN ( ) ARE

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TIMER	135/135
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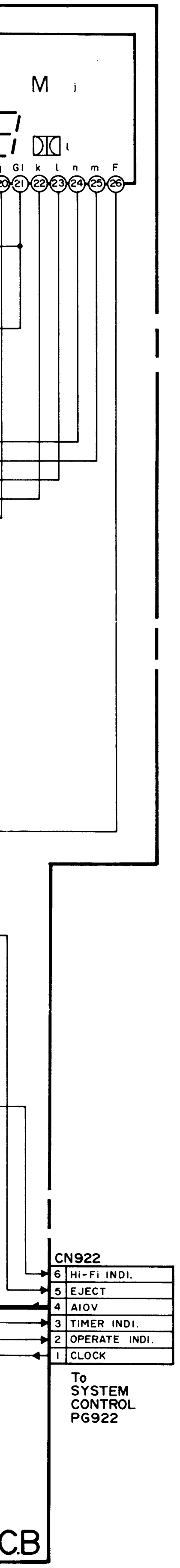
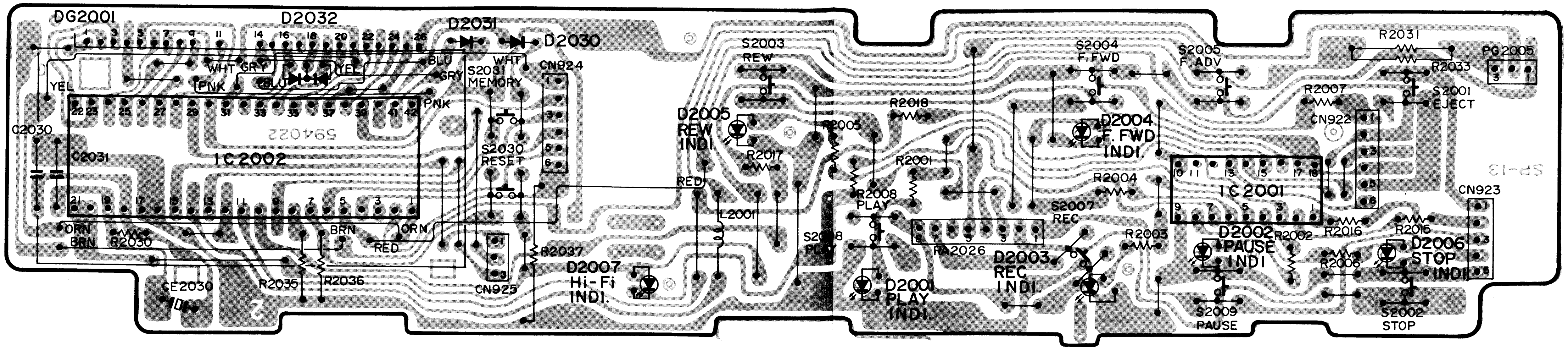

M
CN922
6 Hi-Fi INDI.
5 EJECT
4 AIOV
3 TIMER INDI.
2 OPERATE INDI.
1 CLOCK
To
SYSTEM
CONTROL
PG922
CB


DG2001
D2032
D2031
D2030
IC2002
C2030
C2031
S2031 MEMORY
S2030 RESET
CN924
CN925
R2030
R2035
R2036
R2037
CE2030
D2007 Hi-Fi INDI.
L2001
S2003 REW
D2005 REW INDI.
R2017
R2018
R2005
R2008 PLAY
R2001
S2008 PLAY
D2001 PLAY INDI.
RA2026
S2004 F.FWD
D2004 F.FWD INDI.
R2004
S2007 REC
D2003 REC INDI.
R2003
S2005 F.ADV
IC2001
D2002 PAUSE INDI.
R2002
S2009 PAUSE
R2031
R2007
CN922
R2033
S2001 EJECT
PG2005
R2016
R2015
R2006
D2006 STOP INDI.
S2002 STOP
CN923
YEL
WHT
GRY
PNK
BLU
BRN
ORN
RED
SP-13

OPERATION SWITCH/TAPE COUNTER DISPLAY P.C.B

I C 2001

10	11	12	13	14	15	16	17	18
10 (10)	0 (0)	0 (0)	0 (0)	-13.0(-13.0)	0 (0)	0 (0)	7.0 (7.0)	7.0 (7.0)
9	8	7	6	5	4	3	2	1
0 (0)	0 (0)	0 (0)	0 (0)	10.0 (10.0)	0 (0)	0 (0)	0 (0)	9.4 (9.4)

PG2005

1	-20V
2	AC 3V
3	AC 3V

To
TIMER
PG115
VIA
CNW115

CN923

1	9.5V
2	LOAD
3	DATA
4	LADDER
5	GND

To
SYSTEM
CONTROL
PG923

CN922

1	CLOCK
2	OPERATE INDI.
3	TIMER INDI.
4	AIOV
5	EJECT
6	Hi-Fi INDI.

To
SYSTEM
CONTROL
PG922

CN924

1	SUPPLY REEL
2	TAKE-UP REEL
3	C.REVERSE
4	C.HOLDER UP
5	ATR
6	MEMORY STOP

To
SYSTEM
CONTROL
PG924

CN925

1	RESET
2	DOLBY
3	CAMERA

To
SYSTEM
CONTROL
PG925

I C 2002

22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
—	—	—	—	—	—	—	0 (0)	—	—	—	—	—	—	—	—	—	0 (0)	—	—	—
21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
10.0 (10.0)	10.0(10.0)	7.0 (7.0)	7.0 (7.0)	0 (0)	0 (0)	0 (0)	-13.0(-13.0)	0 (0)	0 (0)	0 (0)	10 (10)	0 (0)	0 (0)	0 (0)	0 (0)	10.0(10.0)	0 (0)	0 (0)	0 (0)	9.4 (9.4)

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VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

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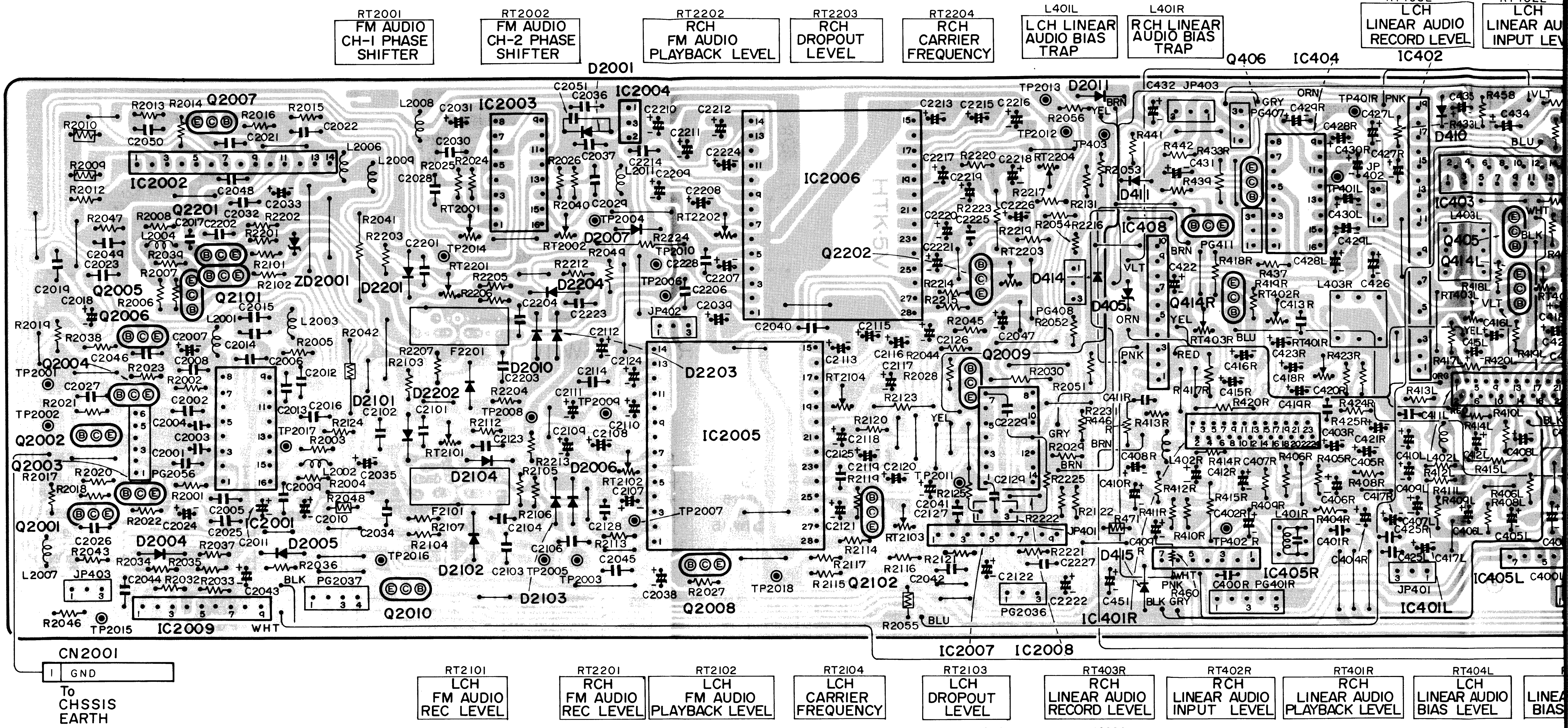

RT2001
FM AUDIO CH-1 PHASE SHIFTER
RT2002
FM AUDIO CH-2 PHASE SHIFTER
RT2202
RCH FM AUDIO PLAYBACK LEVEL
RT2203
RCH DROPOUT LEVEL
RT2204
RCH CARRIER FREQUENCY
L401L
LCH LINEAR AUDIO BIAS TRAP
L401R
RCH LINEAR AUDIO BIAS TRAP
RT403L
LCH LINEAR AUDIO RECORD LEVEL
RT402L
LCH LINEAR AU
INPUT LEV
D2001
Q406
IC404
IC402
IC2002
IC2003
IC2004
IC2005
IC2006
IC2007
IC2008
IC2009
IC2001
IC401L
IC401R
IC403
IC405L
IC405R
IC408
Q2001
Q2002
Q2003
Q2004
Q2005
Q2006
Q2007
Q2008
Q2009
Q2010
Q2101
Q2102
Q2201
Q2202
Q405
Q414L
Q414R
ZD2001
D2004
D2005
D2007
D2010
D2011
D2101
D2102
D2103
D2104
D2201
D2202
D2203
D2204
D405
D410
D411
D414
D415
JP401
JP402
JP403
PG2036
PG2037
PG2056
PG401R
PG407
PG408
PG411
TP2001
TP2002
TP2003
TP2004
TP2005
TP2007
TP2008
TP2009
TP2010
TP2011
TP2012
TP2013
TP2014
TP2015
TP2016
TP2017
TP2018
TP401L
TP401R
TP402R
TP403
F2101
F2201
HTK-5V
BLK
WHT
BLU
YEL
BRN
GRY
PNK
ORN
RED
VLT
CN2001
1 GND
To CHSSIS EARTH
RT2101
LCH FM AUDIO REC LEVEL
RT2201
RCH FM AUDIO REC LEVEL
RT2102
LCH FM AUDIO PLAYBACK LEVEL
RT2104
LCH CARRIER FREQUENCY
RT2103
LCH DROPOUT LEVEL
RT403R
RCH LINEAR AUDIO RECORD LEVEL
RT402R
RCH LINEAR AUDIO INPUT LEVEL
RT401R
RCH LINEAR AUDIO PLAYBACK LEVEL
RT404L
LCH LINEAR AUDIO BIAS LEVEL
LINEA
BIAS

IC2002

1	2	3	4	5	6	7	8	9	10	11	13	14	15
0 (8.8)	0 (4.1)	0 (4.0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (5.3)	0 (0.1)	0 (0)	0 (0.7)	0 (0)	0 (0.2)	0 (8.8)

IC2007

1	2	3	4	5	6	7	8	9
8.0 (8.0)	4.0 (4.0)	4.0 (4.0)	4.0 (4.0)	0 (0)	4.0 4.0	4.0 4.0	4.0 (4.0)	8.1 (8.0)

IC2009

1	2	3	4	5	6	7	8	9
9.5 (9.5)	9.0 (0.1)	0 (0)	4.7 (4.7)	0 (0)	0 (0)	0 (0)	0 (0)	9.5 (9.5)

IC401L

1	3	5	7	9	11	13	15	17	19	21	23
8.2 (8.4)	0 (0)	4.1 (4.2)	4.1 (4.2)	0 (0)	8.2 (8.4)	4.0 (4.1)	3.8 (3.9)	3.8 (3.9)	3.8 (3.9)	0 (0)	3.8 (3.9)
2	4	6	8	10	12	14	16	18	20	22	24
8.2 (0)	4.1 (4.2)	4.1 (4.2)	4.1 (4.2)	4.1 (4.2)	0 (0)	3.8 (3.9)	3.8 (3.9)	3.8 (3.9)	8.2 (8.4)	6.8 (7.0)	3.3 (3.4)

IC401R

1	3	5	7	9	11	13	15	17	19	21	23
8.2 (8.4)	0 (0)	4.1 (4.2)	4.1 (4.2)	0 (0)	8.2 (8.4)	4.0 (4.1)	3.8 (3.9)	3.8 (3.9)	3.8 (3.9)	0 (0)	3.8 (3.9)
2	4	6	8	10	12	14	16	18	20	22	24
8.2 (0)	4.1 (4.2)	4.1 (4.2)	4.1 (4.2)	4.1 (4.2)	0 (0)	3.8 (3.9)	3.8 (3.9)	3.8 (3.9)	8.2 (8.4)	6.8 (7.0)	3.3 (3.4)

IC403

2	4	6	8	10	12	14	
4.8 (4.3)	4.3 (4.3)	0 (5.3)	4.3 (4.3)	4.8 (4.3)	5.6 (0)	8.9 (8.9)	
1	3	5	7	9	11	13	15
4.8 (4.8)	4.8 (4.3)	0 (5.3)	0 (0)	4.8 (4.3)	4.8 (4.7)	5.6 (0)	

IC405L

7	6	5	4	3	2	1
8.2 (0)	8.2 (8.4)	0 (5.3)	0 (0)	0 (0)	0 (0)	0 (0)

IC405R

7	6	5	4	3	2	1
8.2 (0)	8.2 (8.4)	0 (5.3)	0 (0)	0 (0)	0 (0)	0 (0)

IC2004

1	8.9 (8.9)
2	0.7 (0.7)
3	5.7 (5.7)

IC2005

14	5.7 (5.7)	15	2.5 (2.6)
13	2.6 (2.6)	16	0.4 (0.8)
12	2.5 (2.6)	17	3.2 (3.2)
11	2.5 (2.6)	18	0.7 (2.8)
10	2.5 (2.6)	19	0 (0)
9	8.3 (6.3)	20	2.6 (2.6)
8	4.6 (0.2)	21	3.2 (3.2)
7	1.6 (1.6)	22	4.1 (4.1)
6	0 (0)	23	0.3 (0.3)
5	2.5 (2.5)	24	1.2 (0.5)
4	2.0 (0)	25	4.7 (4.7)
3	0.8 (0)	26	8.1 (8.0)
2	0 (0)	27	0.7 (0)
1	8.8 (0.1)	28	8.8 (0.1)

IC402

19	0 (0)
18	0 (0)
17	4.8 (4.7)
16	4.8 (4.3)
15	4.3 (4.3)
14	4.8 (4.3)
13	4.8 (4.8)
12	4.3 (4.3)
11	0 (0)
10	– (–)
9	8.9 (8.9)
8	– (–)
7	0 (0)
6	– (–)
5	4.5 (4.5)
4	– (–)
3	0 (0)
2	0 (0)
1	0 (0)

IC404

8	4.5 (4.5)	9	4.5 (4.5)
7	0 (0)	10	4.5 (4.4)
6	4.5 (4.5)	11	4.5 (4.5)
5	4.5 (4.5)	12	4.5 (4.5)
4	6.7 (7.0)	13	4.5 (4.5)
3	9.2 (9.2)	14	4.5 (4.5)
2	0 (0)	15	8.9 (8.9)
1	0 (0)	16	4.5 (4.5)

IC406

1	4.5 (4.5)
2	4.5 (4.5)
3	4.4 (4.4)
4	0 (0)
5	4.4 (4.4)
6	4.5 (4.5)
7	4.5 (4.5)
8	8.9 (8.9)

IC2001

8	5.6 (0)	9	2.7 (0)
7	0.8 (0)	10	3.9 (0)
6	2.2 (0)	11	0 (0)
5	0.6 (0)	12	5.6 (0)
4	0 (0)	13	3.8 (0)
3	0.6 (0)	14	0 (0)
2	2.2 (0)	15	0.4 (0)
1	0.8 (0)	16	5.6 (0)

IC2003

8	0 (0)	9	4.4 (8.9)
7	6.0 (6.0)	10	4.4 (0)
6	3.0 (3.0)	11	3.0 (3.0)
5	8.9 (8.9)	12	0 (0)
4	4.0 (4.0)	13	8.4 (0)
3	8.9 (8.9)	14	5.4 (8.9)
2	6.4 (6.4)	15	0 (0)
1	0 (0)	16	8.9 (8.9)

IC2006

14	5.7 (5.7)	15	2.5 (2.6)
13	2.6 (2.6)	16	0.4 (0.8)
12	2.5 (2.6)	17	3.2 (3.2)
11	2.5 (2.6)	18	0.7 (2.8)
10	2.5 (2.6)	19	0 (0)
9	8.3 (6.3)	20	2.6 (2.6)
8	4.6 (0.2)	21	3.2 (3.2)
7	1.6 (1.6)	22	4.1 (4.1)
6	0 (0)	23	0.3 (0.3)
5	2.5 (2.5)	24	1.2 (0.5)
4	2.0 (0)	25	4.7 (4.7)
3	0.8 (0)	26	8.1 (8.0)
2	0 (0)	27	0.7 (0)
1	8.8 (0.1)	28	8.8 (0.1)

IC2008

7	0 (0)	8	4.4 (4.0)
6	8.0 (0)	9	4.4 (4.4)
5	8.0 (0)	10	4.0 (4.0)
4	4.4 (4.2)	11	4.0 (4.0)
3	4.4 (4.4)	12	0 (6.0)
2	4.0 (4.0)	13	0 (6.0)
1	4.0 (4.0)	14	8.1 (8.0)

IC407

1	8.8 (8.9)
2	8.3 (8.5)
3	0 (0)
4	0 (0)
5	0 (0)
6	0 (0)
7	8.8 (8.9)
8	0 (8.9)
9	1.3 (0)
10	0 (0)

IC408

10	0 (0)
9	0 (0)
8	0 (0)
7	0 (0)
6	0 (0)
5	8.3 (8.4)
4	8.2 (8.4)
3	8.2 (0)
2	8.8 (0)
1	8.2 (0)

Q2001

B	8.7 (0)
C	9.3 (1.3)
E	9.4 (0)

Q2009

B	0 (0.6)
C	8.0 (0)
E	0 (0)

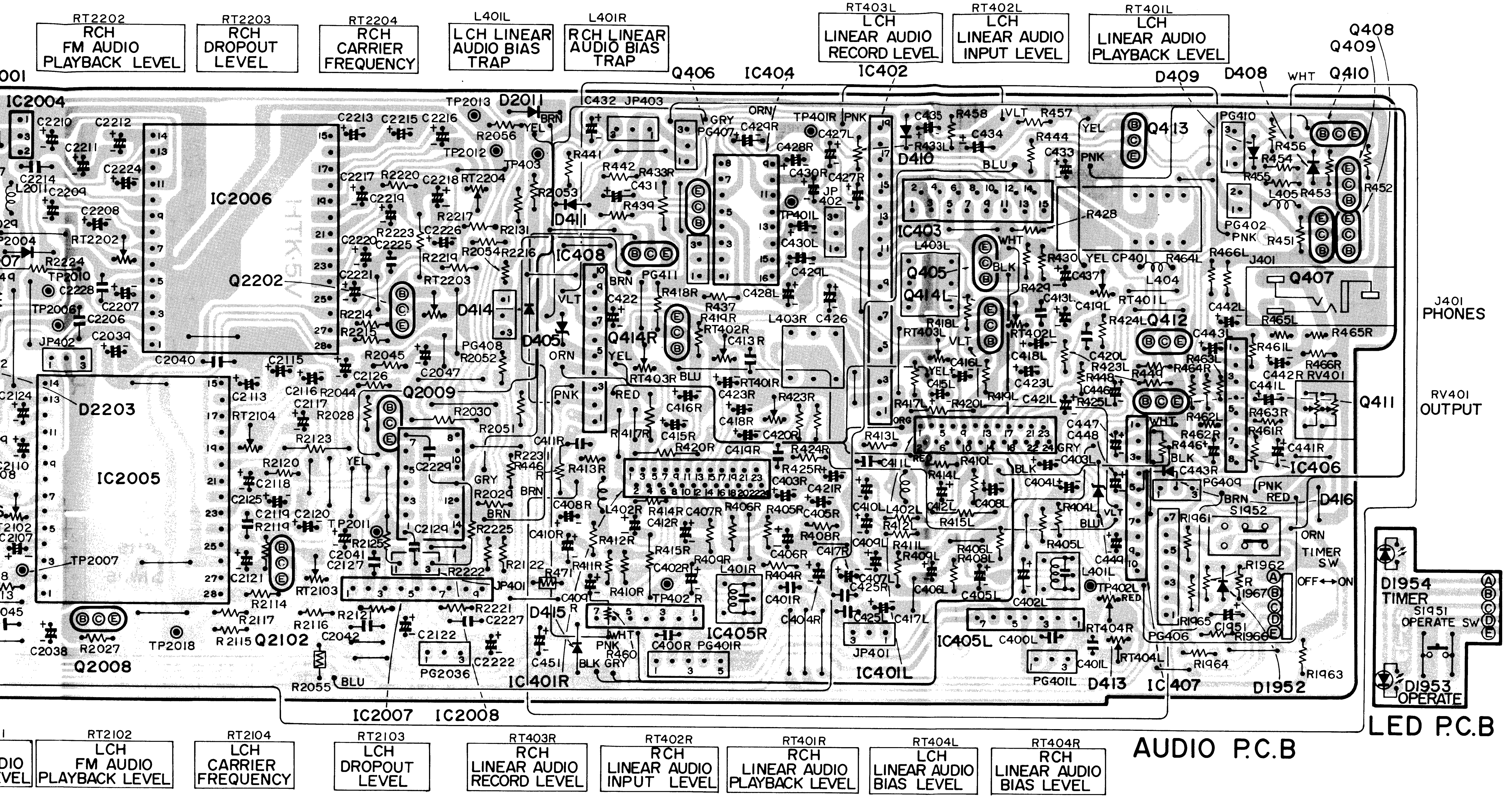
Q407

B	0.8 (0.7)
C	0 (0)
E	0 (0)

Q414R

B	0 (0)
C	0 (0)
E	0 (0)

※ VOLTAGES
VOLTAGES


RT2202
RCH
FM AUDIO
PLAYBACK LEVEL
RT2203
RCH
DROPOUT
LEVEL
RT2204
RCH
CARRIER
FREQUENCY
L401L
LCH LINEAR
AUDIO BIAS
TRAP
L401R
RCH LINEAR
AUDIO BIAS
TRAP
RT403L
LCH
LINEAR AUDIO
RECORD LEVEL
RT402L
LCH
LINEAR AUDIO
INPUT LEVEL
RT401L
LCH
LINEAR AUDIO
PLAYBACK LEVEL
Q408
Q409
Q410
Q406
IC404
IC402
D409
D408
WHT
IC2004
IC2006
IC2005
IC2007
IC2008
IC401R
IC401L
IC403
IC405R
IC405L
IC406
IC407
IC408
Q2202
Q2009
Q2008
Q2102
Q405
Q407
Q411
Q412
Q413
Q414L
Q414R
D2011
D2203
D405
D410
D411
D413
D414
D415
D416
D1952
J401
PHONES
RV401
OUTPUT
TIMER
SW
OFF↔ON
S1952
D1954
TIMER
S1951
OPERATE SW
D1953
OPERATE
A
B
C
D
E
HTK-5V
LED P.C.B
RT2102
LCH
FM AUDIO
PLAYBACK LEVEL
RT2104
LCH
CARRIER
FREQUENCY
RT2103
LCH
DROPOUT
LEVEL
RT403R
RCH
LINEAR AUDIO
RECORD LEVEL
RT402R
RCH
LINEAR AUDIO
INPUT LEVEL
RT401R
RCH
LINEAR AUDIO
PLAYBACK LEVEL
RT404L
LCH
LINEAR AUDIO
BIAS LEVEL
RT404R
RCH
LINEAR AUDIO
BIAS LEVEL

AUDIO P.C.B

	14	
0)	8.9 (8.9)	
	13	15
.7)	5.6 (0)	

	1
0)	0 (0)

	1
0)	0 (0)

IC2004

1	8.9 (8.9)
2	0.7 (0.7)
3	5.7 (5.7)

IC2005

14	5.7 (5.7)	15	2.5 (2.6)
13	2.6 (2.6)	16	0.4 (0.8)
12	2.5 (2.6)	17	3.2 (3.2)
11	2.5 (2.6)	18	0.7 (2.8)
10	2.5 (2.6)	19	0 (0)
9	8.3 (6.3)	20	2.6 (2.6)
8	4.6 (0.2)	21	3.2 (3.2)
7	1.6 (1.6)	22	4.1 (4.1)
6	0 (0)	23	0.3 (0.3)
5	2.5 (2.5)	24	1.2 (0.5)
4	2.0 (0)	25	4.7 (4.7)
3	0.8 (0)	26	8.1 (8.0)
2	0 (0)	27	0.7 (0)
1	8.8 (0.1)	28	8.8 (0.1)

IC402

19	0 (0)
18	0 (0)
17	4.8 (4.7)
16	4.8 (4.3)
15	4.3 (4.3)
14	4.8 (4.3)
13	4.8 (4.8)
12	4.3 (4.3)
11	0 (0)
10	− (−)
9	8.9 (8.9)
8	− (−)
7	0 (0)
6	− (−)
5	4.5 (4.5)
4	− (−)
3	0 (0)
2	0 (0)
1	0 (0)

IC404

8	4.5 (4.5)	9	4.5 (4.5)
7	0 (0)	10	4.5 (4.4)
6	4.5 (4.5)	11	4.5 (4.5)
5	4.5 (4.5)	12	4.5 (4.5)
4	6.7 (7.0)	13	4.5 (4.5)
3	9.2 (9.2)	14	4.5 (4.5)
2	0 (0)	15	8.9 (8.9)
1	0 (0)	16	4.5 (4.5)

IC2001

8	5.6 (0)	9	2.7 (0)
7	0.8 (0)	10	3.9 (0)
6	2.2 (0)	11	0 (0)
5	0.6 (0)	12	5.6 (0)
4	0 (0)	13	3.8 (0)
3	0.6 (0)	14	0 (0)
2	2.2 (0)	15	0.4 (0)
1	0.8 (0)	16	5.6 (0)

IC406

1	4.5 (4.5)
2	4.5 (4.5)
3	4.4 (4.4)
4	0 (0)
5	4.4 (4.4)
6	4.5 (4.5)
7	4.5 (4.5)
8	8.9 (8.9)

IC2003

8	0 (0)	9	4.4 (8.9)
7	6.0 (6.0)	10	4.4 (0)
6	3.0 (3.0)	11	3.0 (3.0)
5	8.9 (8.9)	12	0 (0)
4	4.0 (4.0)	13	8.4 (0)
3	8.9 (8.9)	14	5.4 (8.9)
2	6.4 (6.4)	15	0 (0)
1	0 (0)	16	8.9 (8.9)

IC2006

14	5.7 (5.7)	15	2.5 (2.6)
13	2.6 (2.6)	16	0.4 (0.8)
12	2.5 (2.6)	17	3.2 (3.2)
11	2.5 (2.6)	18	0.7 (2.8)
10	2.5 (2.6)	19	0 (0)
9	8.3 (6.3)	20	2.6 (2.6)
8	4.6 (0.2)	21	3.2 (3.2)
7	1.6 (1.6)	22	4.1 (4.1)
6	0 (0)	23	0.3 (0.3)
5	2.5 (2.5)	24	1.2 (0.5)
4	2.0 (0)	25	4.7 (4.7)
3	0.8 (0)	26	8.1 (8.0)
2	0 (0)	27	0.7 (0)
1	8.8 (0.1)	28	8.8 (0.1)

IC2008

7	0 (0)	8	4.4 (4.0)
6	8.0 (0)	9	4.4 (4.4)
5	8.0 (0)	10	4.0 (4.0)
4	4.4 (4.2)	11	4.0 (4.0)
3	4.4 (4.4)	12	0 (6.0)
2	4.0 (4.0)	13	0 (6.0)
1	4.0 (4.0)	14	8.1 (8.0)

IC407

1	8.8 (8.9)
2	8.3 (8.5)
3	0 (0)
4	0 (0)
5	0 (0)
6	0 (0)
7	8.8 (8.9)
8	0 (8.9)
9	1.3 (0)
10	0 (0)

IC408

10	0 (0)
9	0 (0)
8	0 (0)
7	0 (0)
6	0 (0)
5	8.3 (8.4)
4	8.2 (8.4)
3	8.2 (0)
2	8.8 (0)
1	8.2 (0)

Q2001

B	8.7 (0)
C	9.3 (1.3)
E	9.4 (0)

Q2002

B	0.7 (1.4)
C	0 (0)
E	0 (0)

Q2003

B	0 (0.8)
C	0 (0)
E	0 (0)

Q2004

B	0 (0.8)
C	0 (0)
E	0 (0)

Q2005

B	4.4 (0)
C	8.8 (0.1)
E	3.8 (0)

Q2006

B	6.8 (0.1)
C	5.7 (5.7)
E	5.6 (0)

Q2007

B	0 (4.3)
C	0 (8.8)
E	0 (3.7)

Q2008

B	8.1 (8.0)
C	8.9 (8.9)
E	8.8 (8.8)

Q2009

B	0 (0.6)
C	8.0 (0)
E	0 (0)

Q2010

B	0 (0)
C	9.4 (9.4)
E	0 (0)

Q2101

B	3.8 (0)
C	8.8 (0)
E	3.3 (0)

Q2102

B	7.9 (0)
C	0.7 (0)
E	8.5 (0)

Q2201

B	3.8 (0)
C	8.8 (0)
E	3.3 (0)

Q2202

B	8.0 (0)
C	0.7 (0)
E	8.6 (0)

Q405

B	9.4 (0.1)
C	0 (5.3)
E	0 (0)

Q406

B	8.2 (6.7)
C	6.8 (7.0)
E	6.8 (6.9)

Q407

B	0.8 (0.7)
C	0 (0)
E	0 (0)

Q408

B	0 (0)
C	0.8 (0.7)
E	0 (0)

Q409

B	0.6 (0.5)
C	0 (0)
E	0 (0)

Q410

B	4.1 (4.0)
C	8.9 (8.7)
E	3.7 (3.7)

Q411

B	8.9 (8.1)
C	0.3 (8.8)
E	8.9 (8.9)

Q412

B	0 (6.6)
C	8.9 (0)
E	0 (0)

Q413

B	0 (0)
C	0 (6.6)
E	0 (0)

Q414L

B	0 (0)
C	0 (0)
E	0 (0)

Q414R

B	0 (0)
C	0 (0)
E	0 (0)

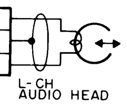
Q415

B	− (6.0)
C	− (7.0)
E	− (6.0)

※VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED RECORD MODE.

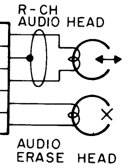
PG401L

1	PLAY
2	GND
3	RECORD


L-CH
AUDIO HEAD

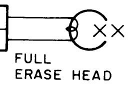
PG401R

1	PLAY
2	GND
3	RECORD
4	GND
5	AUDIO ERASE


R-CH
AUDIO HEAD
AUDIO
ERASE HEAD

PG402

2	GND
1	FULL ERASE


FULL
ERASE HEAD

PG406

7	A10V
6	GND
5	TIMER STAND-BY
4	OPERATE SW
3	RESET
2	OPERATE INDI.
1	TIMER INDI.

To SYSTEM CONTROL PG908 VIA CNW406

PG407

3	ALC CONT
2	MUTE
1	DOLBY

To SYSTEM CONTROL PG905 VIA CNW407

PG408

1	LCH AUDIO
2	GND
3	RCH AUDIO

To JACK PG4706 VIA CNW408

PG409

1	LCH AUDIO
2	GND
3	RCH AUDIO

To JACK PG4707 VIA CNW409

PG410

3	SW25Hz
2	PAUSE
1	INDEX

To SYSTEM CONTROL PG932 VIA CNW410

PG411

3	LCH + RCH
2	RCH
1	LCH

To JACK PG4712 VIA CNW411

PG2036

1	LCH AUDIO
2	GND
3	RCH AUDIO

To TIMER PG123 VIA CNW123

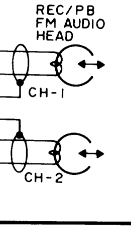
PG2037

1	GND
2	9.5V
3	REC 9V
4	PB 9V

To REGULATOR /SERVO PG1155 VIA CNW1155

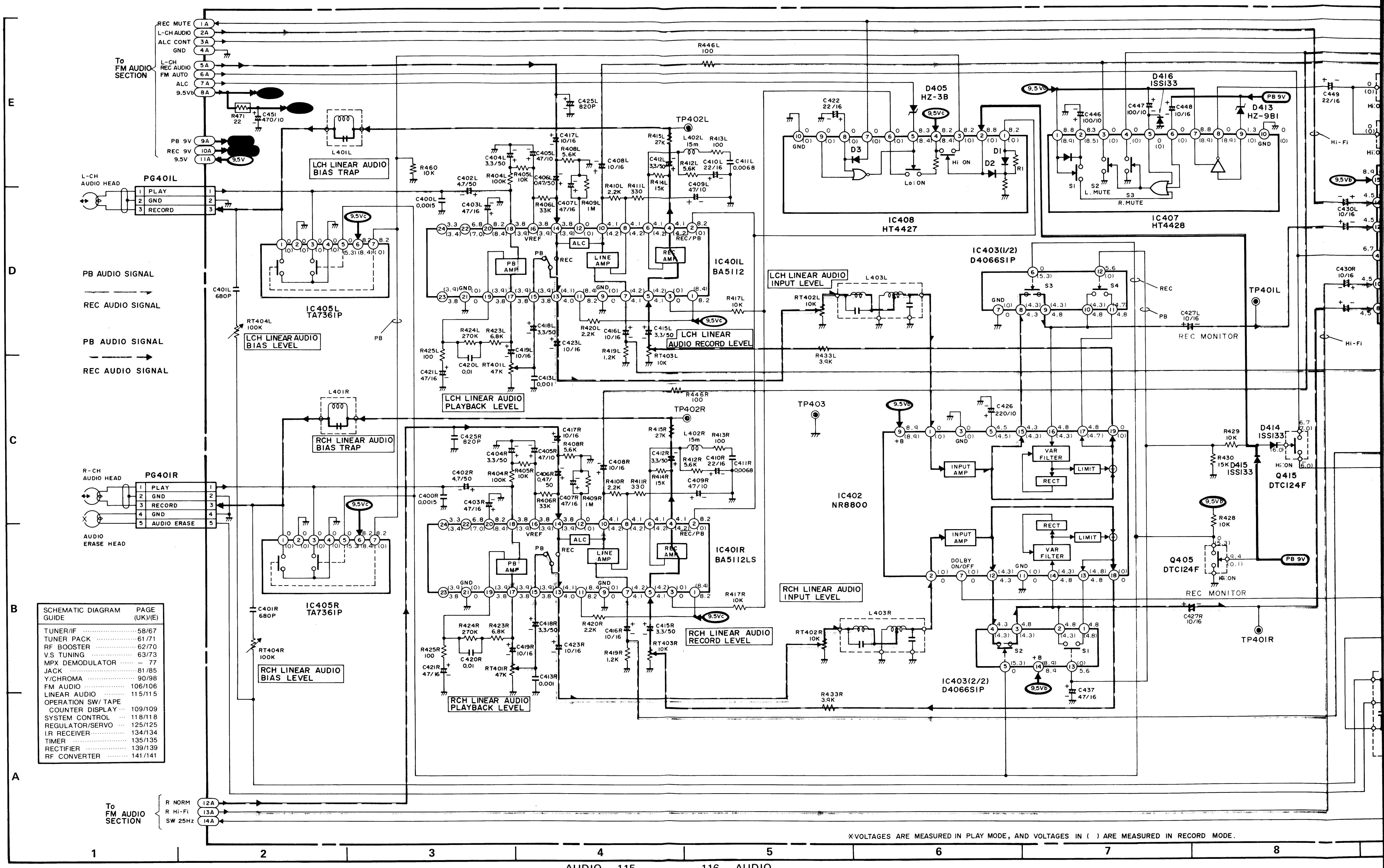
PG2056

6	CH-2 REC
5	CH-2 PLAY
4	GND
3	GND
2	CH-1 PLAY
1	CH-1 REC


REC/PB
FM AUDIO
HEAD
CH-1
CH-2

4 5 6 7 8 9 10 11 12

AUDIO [LINEAR AUDIO SECTION]


E
D
C
B
A
1
2
3
4
5
6
7
8
To FM AUDIO SECTION
REC MUTE 1A
L-CH AUDIO 2A
ALC CONT 3A
GND 4A
L-CH REC AUDIO 5A
FM AUTO 6A
ALC 7A
9.5Vb 8A
PB 9V 9A
REC 9V 10A
9.5V 11A
L-CH AUDIO HEAD
PG401L
PLAY
GND
RECORD
R-CH AUDIO HEAD
PG401R
AUDIO ERASE
AUDIO ERASE HEAD
PB AUDIO SIGNAL
REC AUDIO SIGNAL
L401L
LCH LINEAR AUDIO BIAS TRAP
IC405L TA7361P
RT404L 100K
LCH LINEAR AUDIO BIAS LEVEL
L401R
RCH LINEAR AUDIO BIAS TRAP
IC405R TA7361P
RT404R 100K
RCH LINEAR AUDIO BIAS LEVEL
IC401L BA5112
IC401R BA5112LS
PB AMP
ALC
LINE AMP
REC AMP
VREF
REC/PB
LCH LINEAR AUDIO PLAYBACK LEVEL
RCH LINEAR AUDIO PLAYBACK LEVEL
LCH LINEAR AUDIO RECORD LEVEL
RCH LINEAR AUDIO RECORD LEVEL
TP402L
TP402R
TP403
TP401L
TP401R
LCH LINEAR AUDIO INPUT LEVEL
RCH LINEAR AUDIO INPUT LEVEL
L403L
L403R
RT402L 10K
RT402R 10K
IC402 NR8800
INPUT AMP
VAR FILTER
RECT
LIMIT
DOLBY ON/OFF
IC403(1/2) D4066SIP
IC403(2/2) D4066SIP
REC
PB
REC MONITOR
IC408 HT4427
IC407 HT4428
D405 HZ-3B
D416 ISS133
D413 HZ-9B1
Lo: ON
Hi ON
L. MUTE
R.MUTE
Hi-Fi
D414 ISS133
D415 ISS133
Q415 DTC124F
Q405 DTC124F
R NORM 12A
R Hi-Fi 13A
SW 25Hz 14A

SCHEMATIC DIAGRAM GUIDE	PAGE (UK)/(E)
TUNER/IF	58/67
TUNER PACK	61/71
RF BOOSTER	62/70
V.S TUNING	63/73
MPX DEMODULATOR	– 77
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Y/CHROMA	90/98
FM AUDIO	106/106
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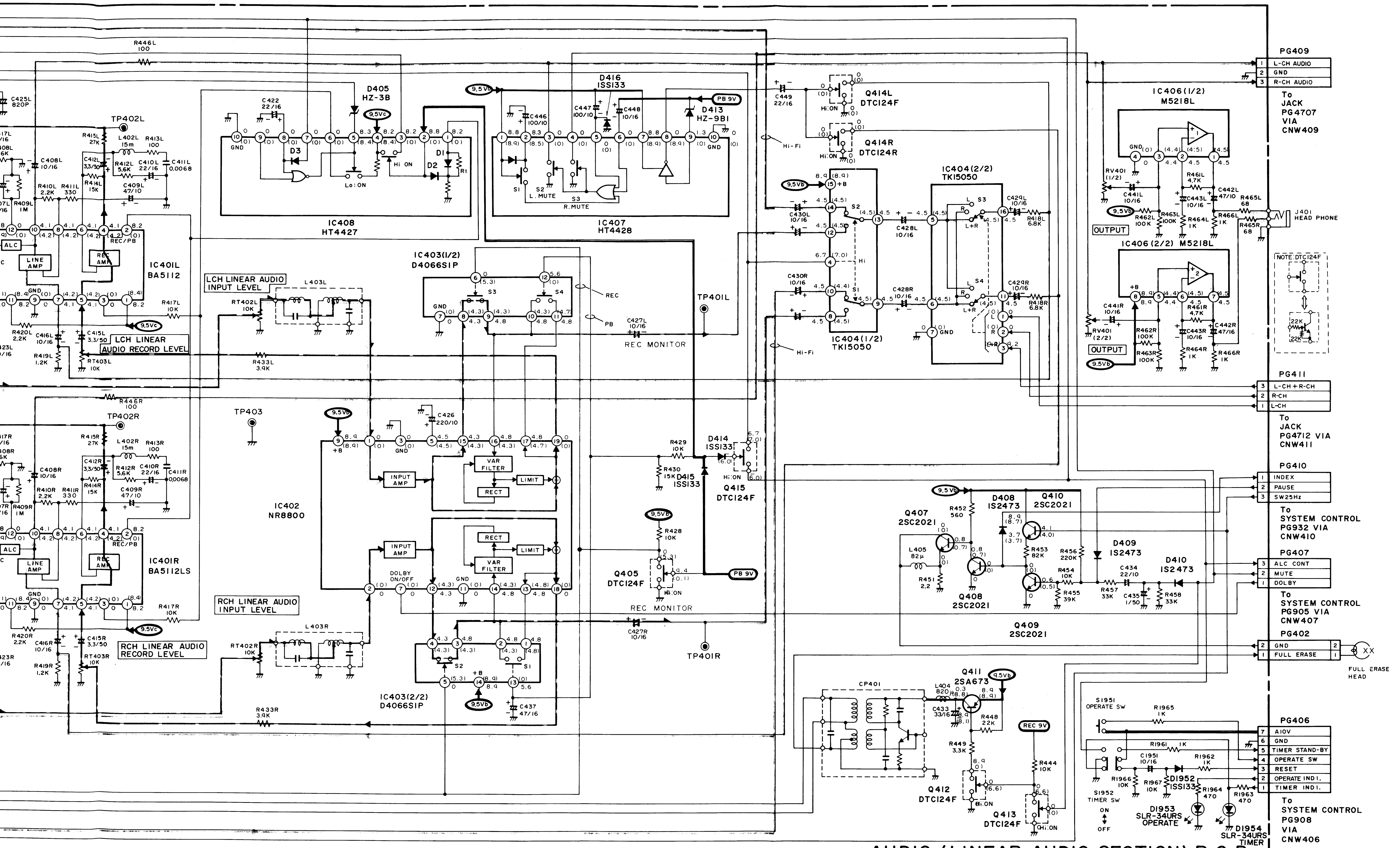
OPERATION SW/ TAPE COUNTER DISPLAY	109/109
SYSTEM CONTROL	118/118
REGULATOR/SERVO	125/125
I.R RECEIVER	134/134
TIMER	135/135
RECTIFIER	139/139
RF CONVERTER	141/141

※VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.



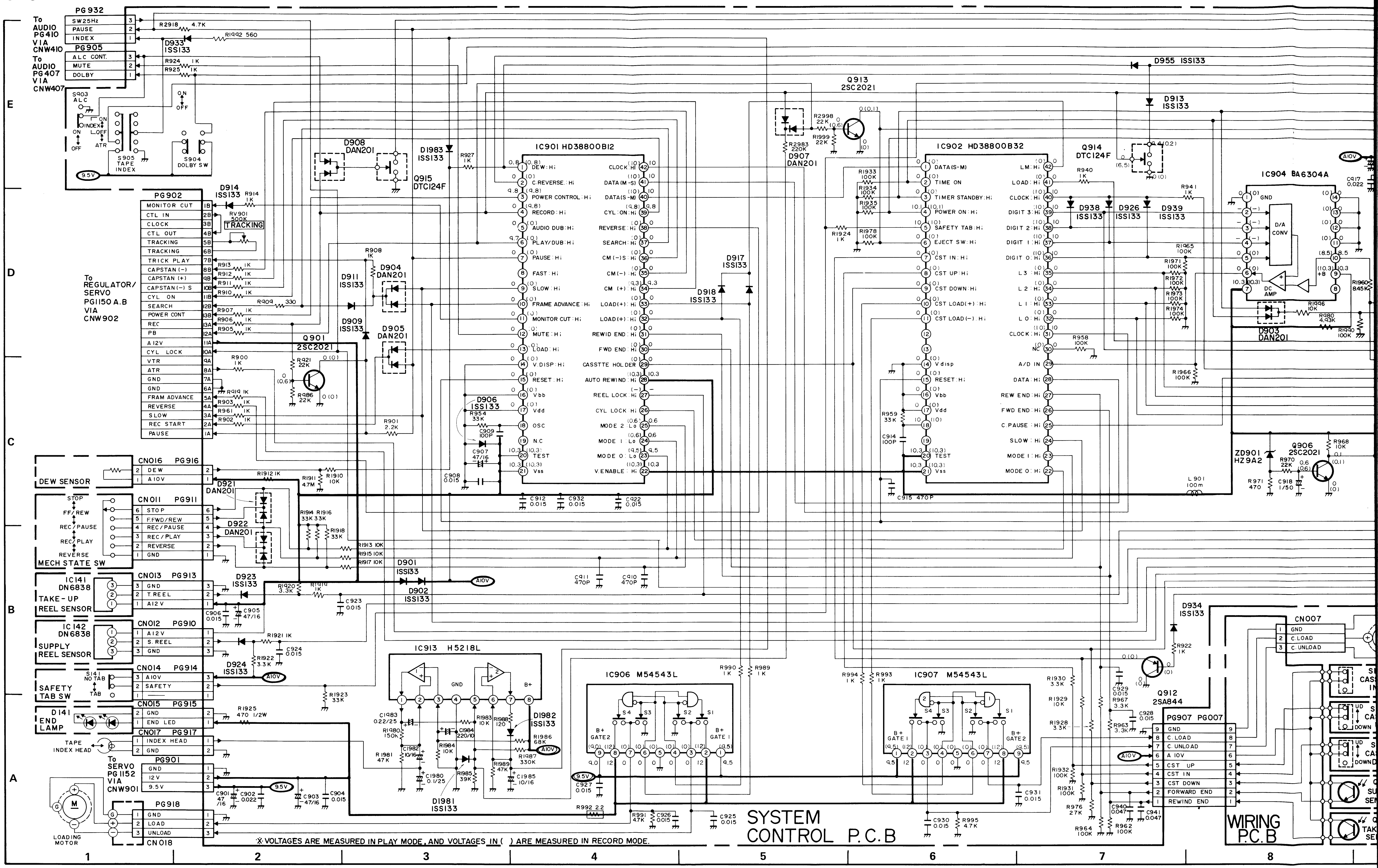
IC408 HT4427
IC407 HT4428
IC403(1/2) D4066SIP
IC403(2/2) D4066SIP
IC402 NR8800
IC401L BA5112
IC401R BA5112LS
IC404(1/2) TK15050
IC404(2/2) TK15050
IC406(1/2) M5218L
IC406(2/2) M5218L
D405 HZ-3B
D416 1SS133
D413 HZ-9B1
D414 1SS133
D415 1SS133
Q414L DTC124F
Q414R DTC124R
Q415 DTC124F
Q405 DTC124F
Q407 2SC2021
Q408 2SC2021
Q409 2SC2021
Q410 2SC2021
D408 1S2473
D409 1S2473
D410 1S2473
Q411 2SA673
Q412 DTC124F
Q413 DTC124F
CP401
S1951 OPERATE SW
S1952 TIMER SW
ON
OFF
D1952 1SS133
D1953 SLR-34URS OPERATE
D1954 SLR-34URS TIMER
TP402L
TP402R
TP403
TP401L
TP401R
LCH LINEAR AUDIO INPUT LEVEL
LCH LINEAR AUDIO RECORD LEVEL
RCH LINEAR AUDIO INPUT LEVEL
RCH LINEAR AUDIO RECORD LEVEL
REC MONITOR
OUTPUT
J401 HEAD PHONE
Hi-Fi
REC
PB
L.MUTE
R.MUTE
INPUT AMP
VAR FILTER
RECT
LIMIT
DOLBY ON/OFF
LINE AMP
REC AMP
ALC
REC/PB
9.5Vb
9.5Vc
PB 9V
REC 9V
NOTE: DTC124F
PG409
1 L-CH AUDIO
2 GND
3 R-CH AUDIO
To JACK PG4707 VIA CNW409
PG411
3 L-CH+R-CH
2 R-CH
1 L-CH
To JACK PG4712 VIA CNW411
PG410
1 INDEX
2 PAUSE
3 SW25Hz
To SYSTEM CONTROL PG932 VIA CNW410
PG407
3 ALC CONT
2 MUTE
1 DOLBY
To SYSTEM CONTROL PG905 VIA CNW407
PG402
2 GND
1 FULL ERASE
FULL ERASE HEAD
PG406
7 A10V
6 GND
5 TIMER STAND-BY
4 OPERATE SW
3 RESET
2 OPERATE INDI.
1 TIMER INDI.
To SYSTEM CONTROL PG908 VIA CNW406

X·VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

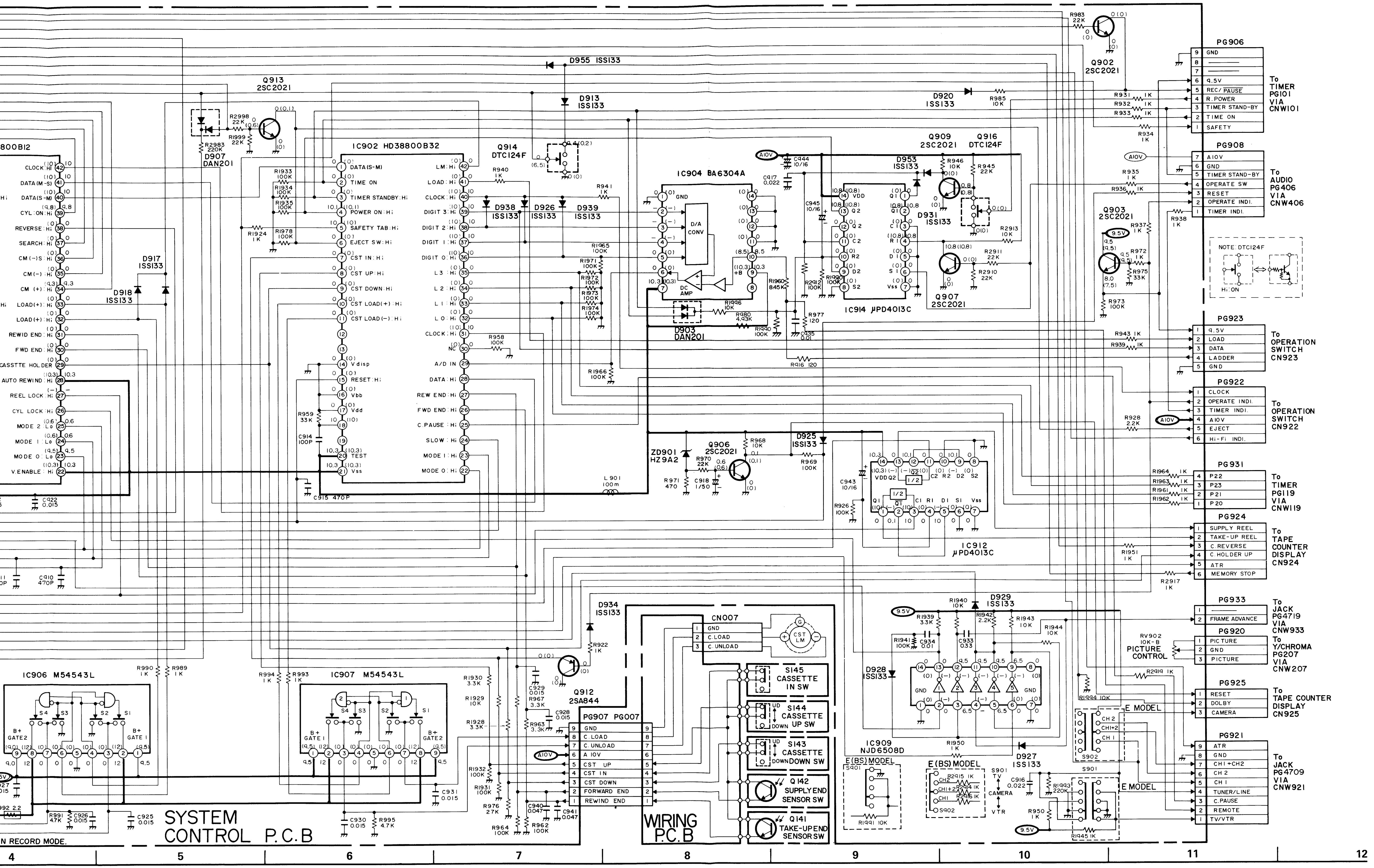
AUDIO (LINEAR AUDIO SECTION) P. C. B

4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12

SYSTEM CONTROL


To AUDIO PG410 VIA CNW410
PG932
SW25Hz
PAUSE
INDEX
PG905
ALC CONT.
MUTE
DOLBY
To AUDIO PG407 VIA CNW407
S903 ALC
S905 TAPE INDEX
S904 DOLBY SW
D933 ISS133
D908 DAN201
D1983 ISS133
Q915 DTC124F
IC901 HD38800B12
Q913 2SC2021
D907 DAN201
IC902 HD38800B32
Q914 DTC124F
D955 ISS133
D913 ISS133
D938 ISS133
D926 ISS133
D939 ISS133
IC904 BA6304A
D/A CONV
DC AMP
D903 DAN201
To REGULATOR/SERVO PG1150 A.B VIA CNW902
PG902
MONITOR CUT
CTL IN
CLOCK
CTL OUT
TRACKING
TRACKING
TRICK PLAY
CAPSTAN (−)
CAPSTAN (+)
CAPSTAN (−) S
CYL ON
SEARCH
POWER CONT
REC
PB
A12V
CYL LOCK
VTR
ATR
GND
GND
FRAM ADVANCE
REVERSE
SLOW
REC START
PAUSE
D914 ISS133
RV901 500K TRACKING
D911 ISS133
D904 DAN201
D909 ISS133
D905 DAN201
Q901 2SC2021
D906 ISS133
D917 ISS133
D918 ISS133
DEW SENSOR
CN016 PG916
MECH STATE SW
CN011 PG911
STOP
FF/REW
REC/PAUSE
REC/PLAY
REVERSE
D921 DAN201
D922 DAN201
IC141 DN6838 TAKE-UP REEL SENSOR
CN013 PG913
D923 ISS133
D901 ISS133
D902 ISS133
A10V
IC142 DN6838 SUPPLY REEL SENSOR
CN012 PG910
D924 ISS133
SAFETY TAB SW
S141
CN014 PG914
D141 END LAMP
CN015 PG915
TAPE INDEX HEAD
CN017 PG917
To SERVO PG1152 VIA CNW901
PG901
LOADING MOTOR
PG918
CN018
IC913 H5218L
D1982 ISS133
D1981 ISS133
IC906 M54543L
IC907 M54543L
ZD901 HZ9A2
Q906 2SC2021
L901 100m
D934 ISS133
Q912 2SA844
PG907 PG007
GND
C.LOAD
C.UNLOAD
A 10V
CST UP
CST IN
CST DOWN
FORWARD END
REWIND END
CN007
WIRING P.C.B
9.5V
SYSTEM CONTROL P.C.B
A
B
C
D
E
1
2
3
4
5
6
7
8

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.


IC902 HD38800B32
IC904 BA6304A
IC914 µPD4013C
IC912 µPD4013C
IC906 M54543L
IC907 M54543L
IC909 NJD6508D
Q913 2SC2021
Q914 DTC124F
Q902 2SC2021
Q909 2SC2021
Q916 DTC124F
Q903 2SC2021
Q907 2SC2021
Q906 2SC2021
Q912 2SA844
D955 ISS133
D913 ISS133
D920 ISS133
D907 DAN201
D917 ISS133
D918 ISS133
D938 ISS133
D926 ISS133
D939 ISS133
D953 ISS133
D931 ISS133
D903 DAN201
ZD901 HZ9A2
D925 ISS133
D934 ISS133
D929 ISS133
D928 ISS133
D927 ISS133
L901 100m
D/A CONV
DC AMP
PG906
GND
9.5V
REC/PAUSE
R.POWER
TIMER STAND-BY
TIME ON
SAFETY
To TIMER PG101 VIA CNW101
PG908
A10V
GND
TIMER STAND-BY
OPERATE SW
RESET
OPERATE INDI.
TIMER INDI.
To AUDIO PG406 VIA CNW406
NOTE DTC124F
Hi:ON
PG923
9.5V
LOAD
DATA
LADDER
GND
To OPERATION SWITCH CN923
PG922
CLOCK
OPERATE INDI.
TIMER INDI.
A10V
EJECT
Hi-Fi INDI.
To OPERATION SWITCH CN922
PG931
P22
P23
P21
P20
To TIMER PG119 VIA CNW119
PG924
SUPPLY REEL
TAKE-UP REEL
C.REVERSE
C.HOLDER UP
ATR
MEMORY STOP
To TAPE COUNTER DISPLAY CN924
PG933
FRAME ADVANCE
To JACK PG4719 VIA CNW933
PG920
PICTURE
GND
PICTURE
To Y/CHROMA PG207 VIA CNW207
RV902 10K-B PICTURE CONTROL
PG925
RESET
DOLBY
CAMERA
To TAPE COUNTER DISPLAY CN925
E MODEL
S902
S901
PG921
ATR
GND
CH1+CH2
CH2
CH1
TUNER/LINE
C.PAUSE
REMOTE
TV/VTR
To JACK PG4709 VIA CNW921
E(BS) MODEL
S401
S901 TV CAMERA VTR
PG907 PG007
GND
C.LOAD
C.UNLOAD
A10V
CST UP
CST IN
CST DOWN
FORWARD END
REWIND END
CN007
GND
C.LOAD
C.UNLOAD
CST LM
S145 CASSETTE IN SW
S144 CASSETTE UP SW
S143 CASSETTE DOWN SW
Q142 SUPPLY END SENSOR SW
Q141 TAKE-UP END SENSOR SW
DATA(S-M)
TIME ON
TIMER STANDBY:Hi
POWER ON:Hi
SAFETY TAB:Hi
EJECT SW:Hi
CST IN:Hi
CST UP:Hi
CST DOWN:Hi
CST LOAD(+):Hi
CST LOAD(-):Hi
Vdisp
RESET:Hi
Vbb
Vdd
TEST
Vss
LM:Hi
LOAD:Hi
CLOCK:Hi
DIGIT 3:Hi
DIGIT 2:Hi
DIGIT 1:Hi
DIGIT 0:Hi
L3:Hi
L2:Hi
L1:Hi
L0:Hi
CLOCK:Hi
NC
A/D IN
DATA:Hi
REW END:Hi
FWD END:Hi
C.PAUSE:Hi
SLOW:Hi
MODE 1:Hi
MODE 0:Hi
800B12
CLOCK:Hi
DATA(M-S)
DATA(S-M)
CYL ON:Hi
REVERSE:Hi
SEARCH:Hi
CM(-)S:Hi
CM(-):Hi
CM(+):Hi
LOAD(+):Hi
LOAD(+):Hi
REWID END:Hi
FWD END:Hi
CASSTTE HOLDER
AUTO REWIND:Hi
REEL LOCK:Hi
CYL LOCK:Hi
MODE 2:Lo
MODE 1:Lo
MODE 0:Lo
V.ENABLE:Hi
B+ GATE 2
B+ GATE 1
N RECORD MODE.
SYSTEM CONTROL P.C.B
WIRING P.C.B
4
5
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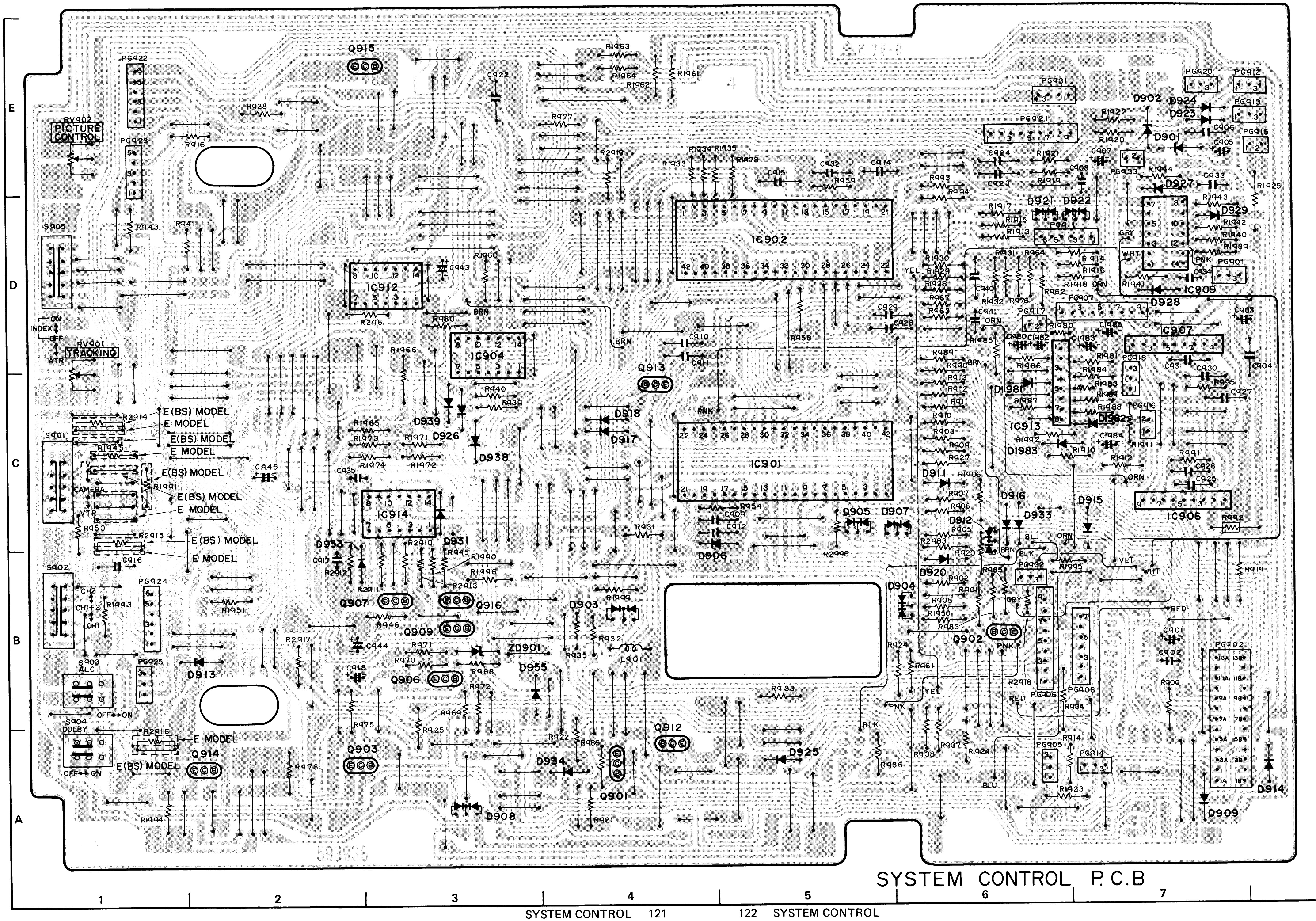
10
11
12


E
D
C
B
A
1
2
3
4
5
6
7
8
K 7V-0
593936
Q915
PG922
PG923
RV902
PICTURE CONTROL
R928
R916
C922
R977
R1963
R1964
R1962
R1961
PG931
PG921
PG920
PG912
PG913
PG915
D902
D924
D923
D901
C906
C905
R1922
R1920
C924
C923
R1921
R1919
C907
C908
PG933
R1944
D927
C933
R1925
R2919
R1934
R1935
R1933
R1978
C915
C932
R1959
C914
R1993
R1994
R1917
R1915
R1913
D921
D922
PG911
R1943
D929
R1942
R1940
R1939
IC902
S905
R943
R941
IC912
R246
C943
R1960
R980
BRN
IC904
R1966
R1930
R1929
R1928
R1967
R1963
C940
R1932
R1976
R1931
R1964
R1962
R1914
R1916
R1918
ORN
R1941
C934
IC909
PG901
GRY
WHT
PNK
YEL
D928
PG907
PG917
C941
C929
C928
C910
C911
R958
R1985
R1980
C1483
C1485
C1480
C1482
R1986
R1981
R1984
R1983
PG918
IC907
C903
C904
C931
C930
R995
C927
INDEX
ON
OFF
ATR
RV901
TRACKING
Q913
R1989
R1990
R913
R912
R911
R910
D918
D917
D939
D926
D938
R940
R939
D1981
R1987
IC913
R1989
R1988
PG916
D1982
R1992
D1983
C1984
R1911
R1910
R1912
IC901
R1965
R1973
R1971
R1974
R1972
S901
E(BS) MODEL
E MODEL
R2914
R1945
TV
CAMERA
VTR
R1991
R950
R2915
C916
C945
C935
IC914
D911
R1906
R1907
R1906
D916
D933
D915
R991
C926
C925
IC906
R992
R954
C909
C912
D905
D907
R931
D912
R1905
D906
R2998
D953
C917
R2412
R2911
D931
R2910
R945
R1990
R1996
R2413
R2983
R1920
D920
R985
BLU
BLK
ORN
PG932
R1995
VLT
WHT
R919
S902
CH2
CH1+2
CH1
R1993
PG924
R1951
Q907
Q916
R946
Q909
D903
R1999
R902
R1901
R1908
R1950
R1983
D904
Q902
GRY
RED
C901
C902
PG902
R2917
C944
R971
R970
ZD901
Q906
R968
D955
R972
R932
L901
R935
S903
ALC
PG925
D913
OFF↔ON
C918
R975
R925
R1969
R924
R1961
YEL
PNK
R2918
PNK
PG906
PG908
R934
R900
R933
BLK
R936
R938
R937
R1924
S904
DOLBY
R2916
Q914
Q903
R973
R922
R986
Q912
D925
D934
Q901
PG905
PG914
R1914
R1923
D914
D909
R1994
D908
R921

SYSTEM CONTROL P.C.B

PG901 To REGULATOR SERVO PG1152 VIA CNW901

1	GND
2	12V
3	9.5V

PG902 To REGULATOR SERVO PG1150 A, B VIA CNW902

13A	REC
12A	PB
11A	A12V
10A	CYL. LOCK
9A	VTR
8A	ATR
7A	GND
6A	GND
5A	FRAM ADVANCE
4A	REVERSE
3A	SLOW
2A	REC START
1A	PAUSE
13B	POWER CONT.
12B	SEARCH
11B	CYL. ON
10B	CAPSTAN (−) S
9B	CAPSTAN (+)
8B	CAPSTAN (−)
7B	TRICK PLAY
6B	TRACKING
5B	TRACKING
4B	CTL OUT
3B	CLOCK
2B	CTL IN
1B	MONITOR CUT

PG905 To AUDIO PG407 VIA CNW405

3	ALC CONT.
2	MUTE
1	DOLBY

PG906 To TIMER PG101 VIA CNW101

9	GND
8	———
7	———
6	9.5V
5	REC / $\overline{\text{PAUSE}}$
4	R.POWER
3	TIMER STAND-BY
2	TIME ON
1	SAFETY

PG907 To WIRING PG007

9	GND
8	C. LOAD
7	C. UNLOAD
6	A10V
5	CST UP
4	CST IN
3	CST DOWN
2	FORWARD END
1	REWIND END

PG908 To AUDIO PG406 VIA CNW406

7	A10V
6	GND
5	TIMER STAND-BY
4	OPERATE SW
3	RESET
2	OPERATE INDI.
1	TIMER INDI.

PG911 To MECH STATE SWITCH CN011

6	STOP
5	F.FWD/REW
4	REC/PAUSE
3	REC/PLAY
2	REVERSE
1	GND

PG901

1	GND
2	12V
3	9.5V

To REGULATOR/ SERVO PG1152 VIA CNW901

PG902

13A	REC
12A	PB
11A	A12V
10A	CYL. LOCK
9A	VTR
8A	ATR
7A	GND
6A	GND
5A	FRAM ADVANCE
4A	REVERSE
3A	SLOW
2A	REC START
1A	PAUSE
13B	POWER CONT.
12B	SEARCH
11B	CYL. ON
10B	CAPSTAN (−) S
9B	CAPSTAN (+)
8B	CAPSTAN (−)
7B	TRICK PLAY
6B	TRACKING
5B	TRACKING
4B	CTL OUT
3B	CLOCK
2B	CTL IN
1B	MONITOR CUT

To REGULATOR/ SERVO PG1150 A, B VIA CNW902

PG905

3	ALC CONT.
2	MUTE
1	DOLBY

To AUDIO PG407 VIA CNW405

PG906

9	GND
8	———
7	———
6	9.5V
5	REC/PAUSE
4	R.POWER
3	TIMER STAND-BY
2	TIME ON
1	SAFETY

To TIMER PG101 VIA CNW101

PG907

9	GND
8	C. LOAD
7	C. UNLOAD
6	A10V
5	CST UP
4	CST IN
3	CST DOWN
2	FORWARD END
1	REWIND END

To WIRING PG007

PG908

7	A10V
6	GND
5	TIMER STAND-BY
4	OPERATE SW
3	RESET
2	OPERATE INDI.
1	TIMER INDI.

To AUDIO PG406 VIA CNW406

PG911

6	STOP
5	F.FWD/REW
4	REC/PAUSE
3	REC/PLAY
2	REVERSE
1	GND

To MECH STATE SWITCH CN011

PG910

1	A12V
2	S.REEL
3	GND

To SUPPLY REEL SENSOR CN012

PG913

3	GND
2	T. REEL
1	A12V

To TAKE-UP REEL SENSOR CN013

PG914

3	A10V
2	SAFETY
1	———

To SAFETY TAB SWITCH CN014

PG915

2	GND
1	END LED

To END LAMP CN015

PG916

2	DEW
1	A10V

DEW SENSOR

PG917

1	INDEX HEAD
2	GND

TAPE INDEX HEAD

PG918

3	UNLOAD
2	LOAD
1	GND

To LOADING MOTOR CN018

PG920

1	PICTURE
2	GND
3	PICTURE

To Y/CHROMA PG207 VIA CNW207

PG921

9	ATR
8	GND
7	CH1+CH2
6	CH2
5	CH1
4	TUNER/LINE
3	C. PAUSE
2	REMOTE
1	TV/VTR

To JACK PG4709 VIA CNW921

PG922

6	Hi-Fi INDI.
5	EJECT
4	A10V
3	TIMER INDI.
2	OPERATE INDI.
1	CLOCK

To OPERATION SWITCH CN922

PG923

5	GND
4	LADDER
3	DATA
2	LOAD
1	9.5V

To OPERATION SWITCH CN923

PG924

6	MEMORY STOP
5	ATR
4	C.HOLDER UP
3	C. REVERSE
2	TAKE-UP REEL
1	SUPPLY REEL

To TAPE COUNTER DISPLAY CN924

PG925

3	CAMERA
2	DOLBY
1	RESET

To TAPE COUNTER DISPLAY CN925

PG931

4	P22
3	P23
2	P21
1	P20

To TIMER PG119 VIA CNW119

PG932

3	SW25Hz
2	PAUSE
1	INDEX

To AUDIO PG410 VIA CNW410

PG933

1	9.5V
2	FRAM ADVANCE

To JACK PG4719 VIA CNW933

IC901

22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
10.3(10.3)	9.5(9.5)	0.6(0.6)	0.6(0.6)		−(−)	10.3(10.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	9.3(9.3)	0 (0)	0 (0)	0 (0)	0 (0)	9.8(9.8)	10(10)	10 (10)	10 (10)
21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
10.3(10.3)	10.3(10.3)		−(−)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)		0 (0)	9.7(0)	0 (0)	0 (9.8)	9.8(9.8)	0 (0)	0.8(0.8)

IC902

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
10 (10)	0 (0)	0 (0)	10.1(10.1)	10 (10)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)			0 (0)	0 (0)	0 (0)	0 (0)	10 (10)		10.3(10.3)	10.3(10.3)
42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22
0 (0)	0 (0)	10 (10)	10 (10)	10 (10)	10 (10)	10 (10)	0 (0)	0 (0)	0 (0)	0 (0)	10 (10)	0 (0)								

IC912

8	9	10	11	12	13	14
0 (0)	10.1 (−)	0 (0)	0 (0)	10.1(−)	0 (−)	10.3(10.3)
7	6	5	4	3	2	1
0 (0)	0 (0)	10 (−)	0 (0)	10 (10)	0.1 (−)	0 (10)

IC914

8	9	10	11	12	13	14
0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	10.8(10.8)	10.8(10.8)
7	6	5	4	3	2	1
0 (0)	0 (0)	0 (0)	10.8(10.8)	0 (0)	10.8(10.8)	0 (0)

Q901

B	0 (0.6)
C	0 (0)
E	0 (0)

Q902

B	0 (0)
C	0 (0)
E	0 (0)

Q903

B	9.5(9.5)
C	9.5(9.5)
E	8.0(7.5)

IC904

8	9	10	11	12	13	14
	10.3(10.3)	8.5(8.5)	0 (0)	0 (0)	0 (0)	0 (0)
7	6	5	4	3	2	1
0 (0)	0 (0)	0 (0)	−(−)	−(−)	−(−)	0 (0)

IC909

7	0 (0)	8	0 (0)
6	0 (0)	9	6.5 (−)
5	6.5	10	9.5 (−)
4	−(−)	11	9.5 (−)
3	6.5	12	9.5 (−)
2	0 (−)	13	0 (−)
1	0 (0)	14	0 (0)

IC906

9	8	7	6	5	4	3	2	1
9.0(9.0)	12 (12)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	12 (12)	9.5(9.5)

IC907

1	2	3	4	5	6	7	8	9
9.5(9.5)	12 (12)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	12 (12)	9.5(9.5)

Q906

B	0.6 (0.6)
C	0.1 (0.1)
E	0 (0)

Q907

B	0 (0)
C	10.8(10.8)
E	0 (0)

Q909

B	0.8(0.8)
C	0 (0)
E	0 (0)

Q912

B	0 (0)
C	0 (0)
E	0 (0)

Q913

B	0 (0.6)
C	0 (0.1)
E	0 (0)

Q914

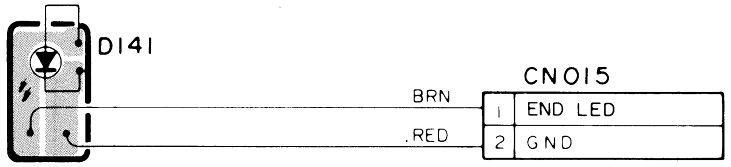
B	0 (6.5)
C	9.4(0.2)
E	0 (0)

Q915

B	0 (10)
C	9.2 (0)
E	0 (0)

Q916

B	0 (0)
C	0.8(0.8)
E	0 (0)

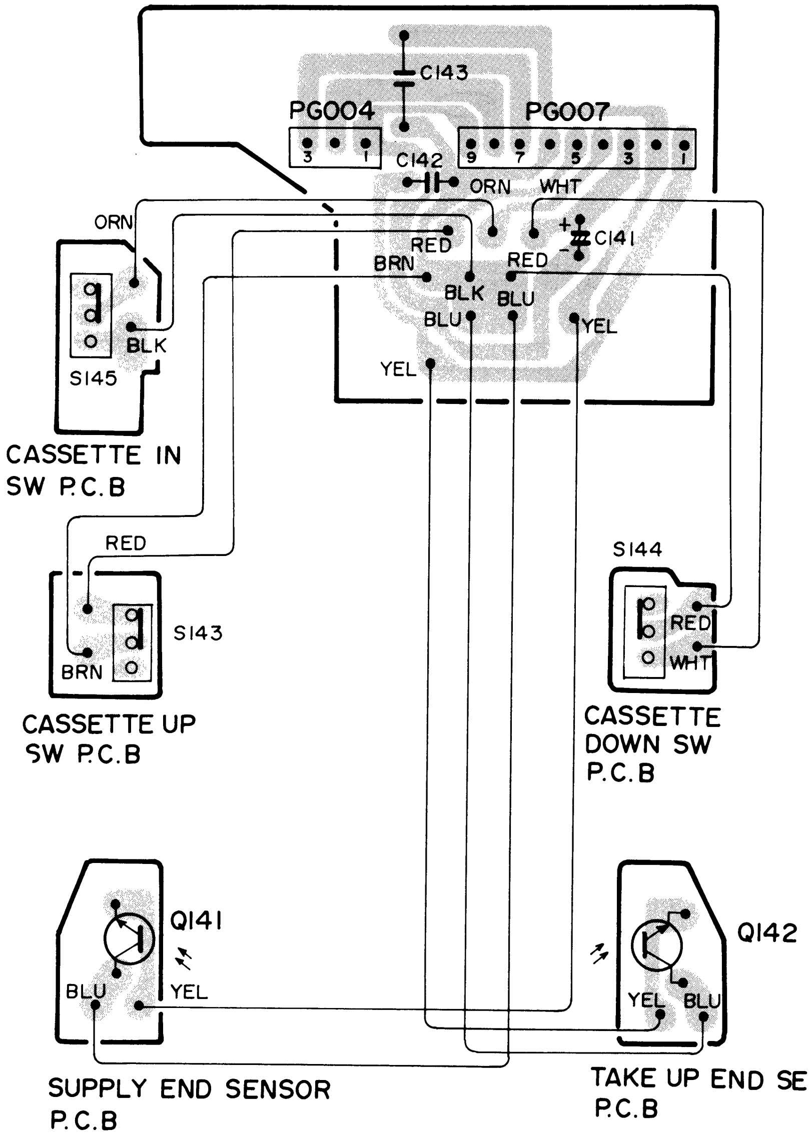


CN015

1	END LED
2	GND

To SYSTEM CONTROL PG915

END LAMP P.C.B



PG004

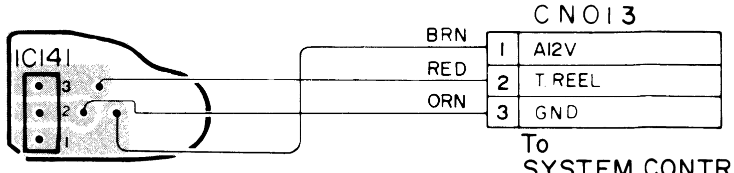
1	GND
2	LOADING
3	UNLOADING

To CASSETTE LOADING MOTOR

PG007

9	GND
8	LOADING
7	UNLOADING
6	A10V
5	CST UP
4	CST IN
3	CST DOWN
2	F.FWD END
1	REWIND END

To SYSTEM CONTROL PG907

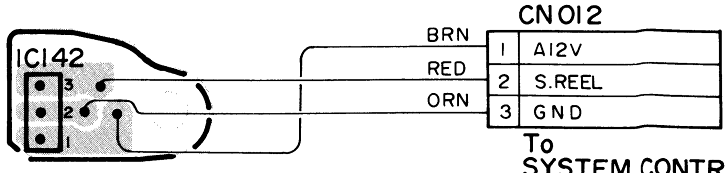


CN013

1	A12V
2	T.REEL
3	GND

TAKE-UP REEL SENSOR P.C.B

To SYSTEM CONTROL PG913



CN012

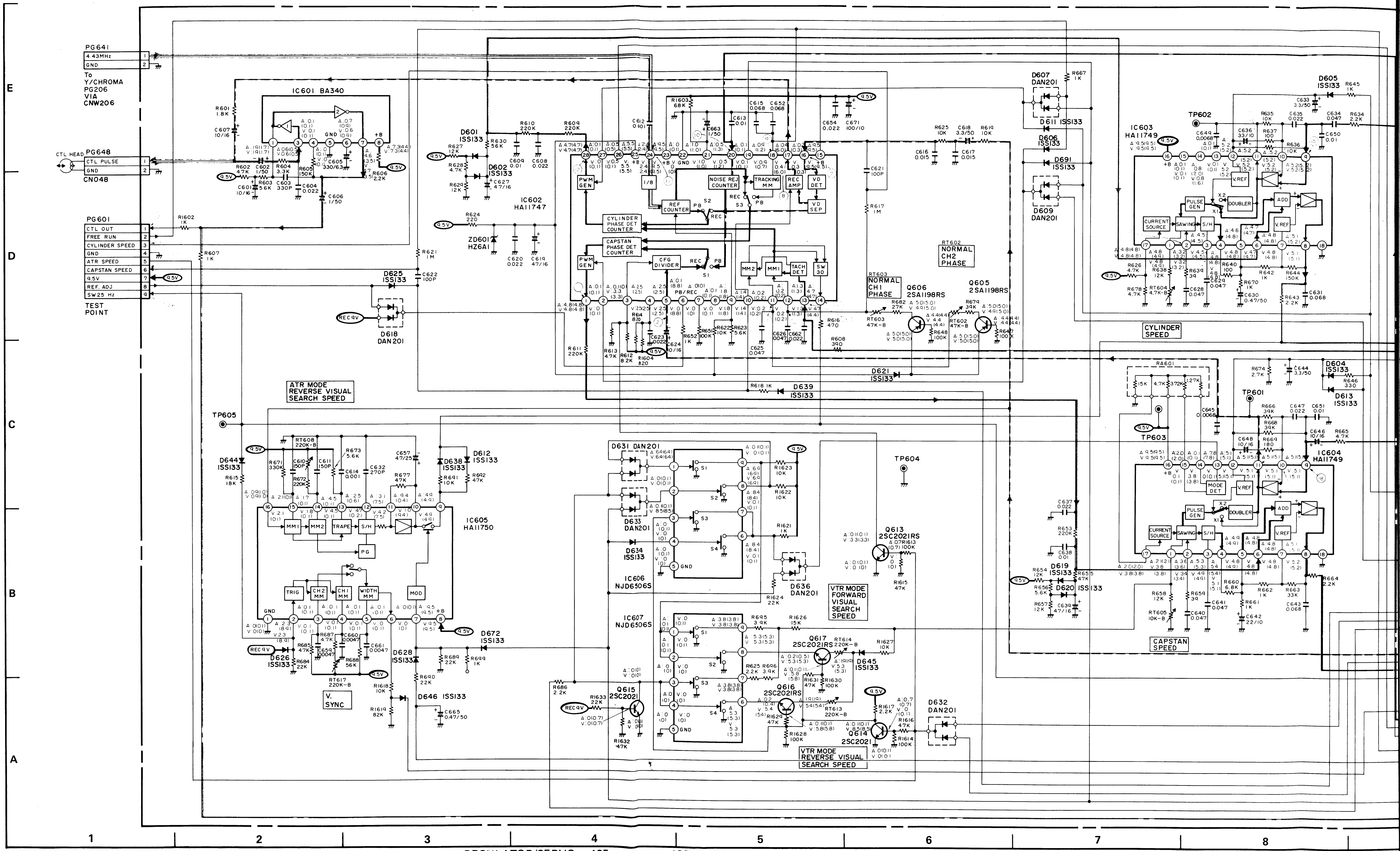
1	A12V
2	S.REEL
3	GND

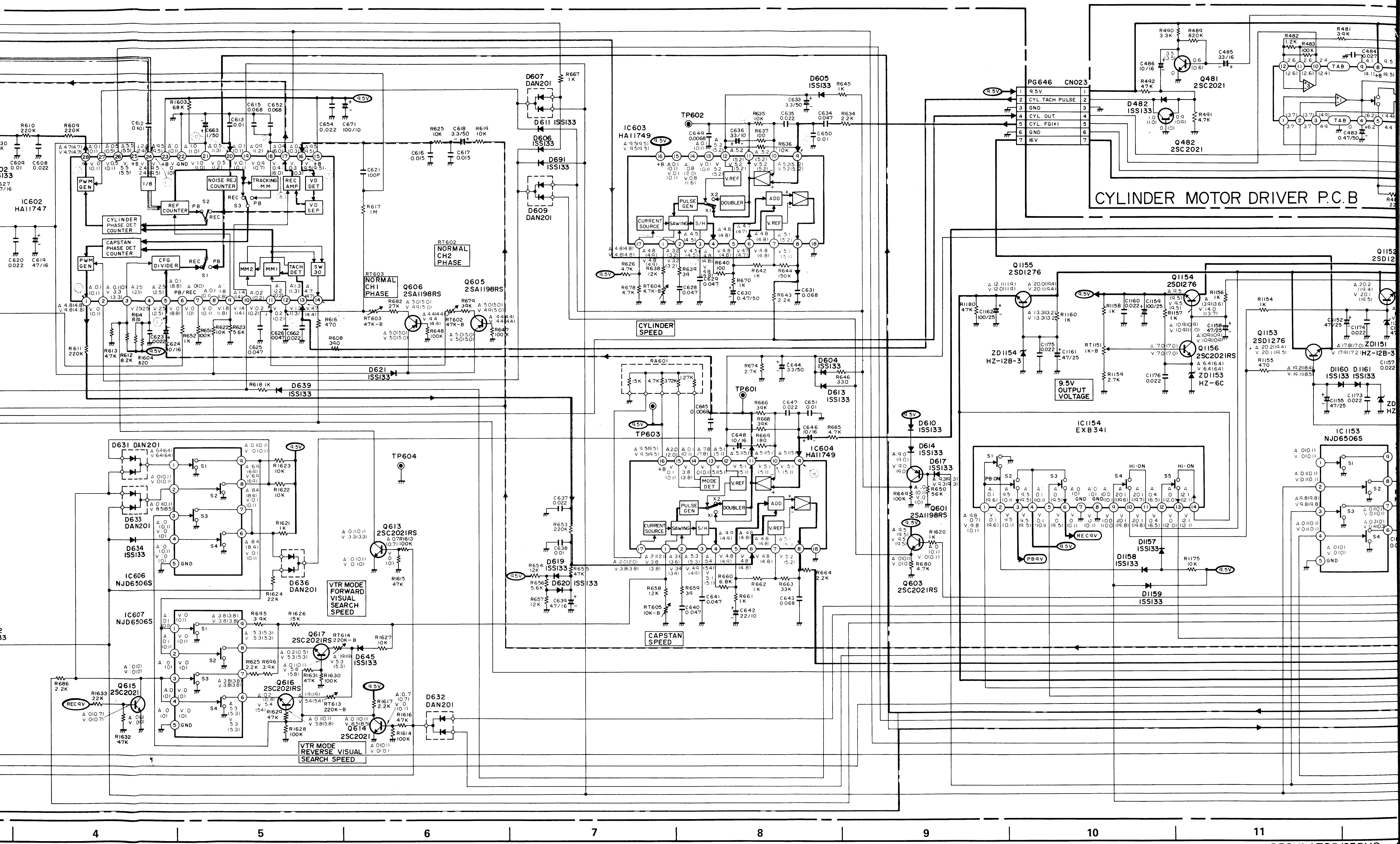
SUPPLY REEL SENSOR P.C.B

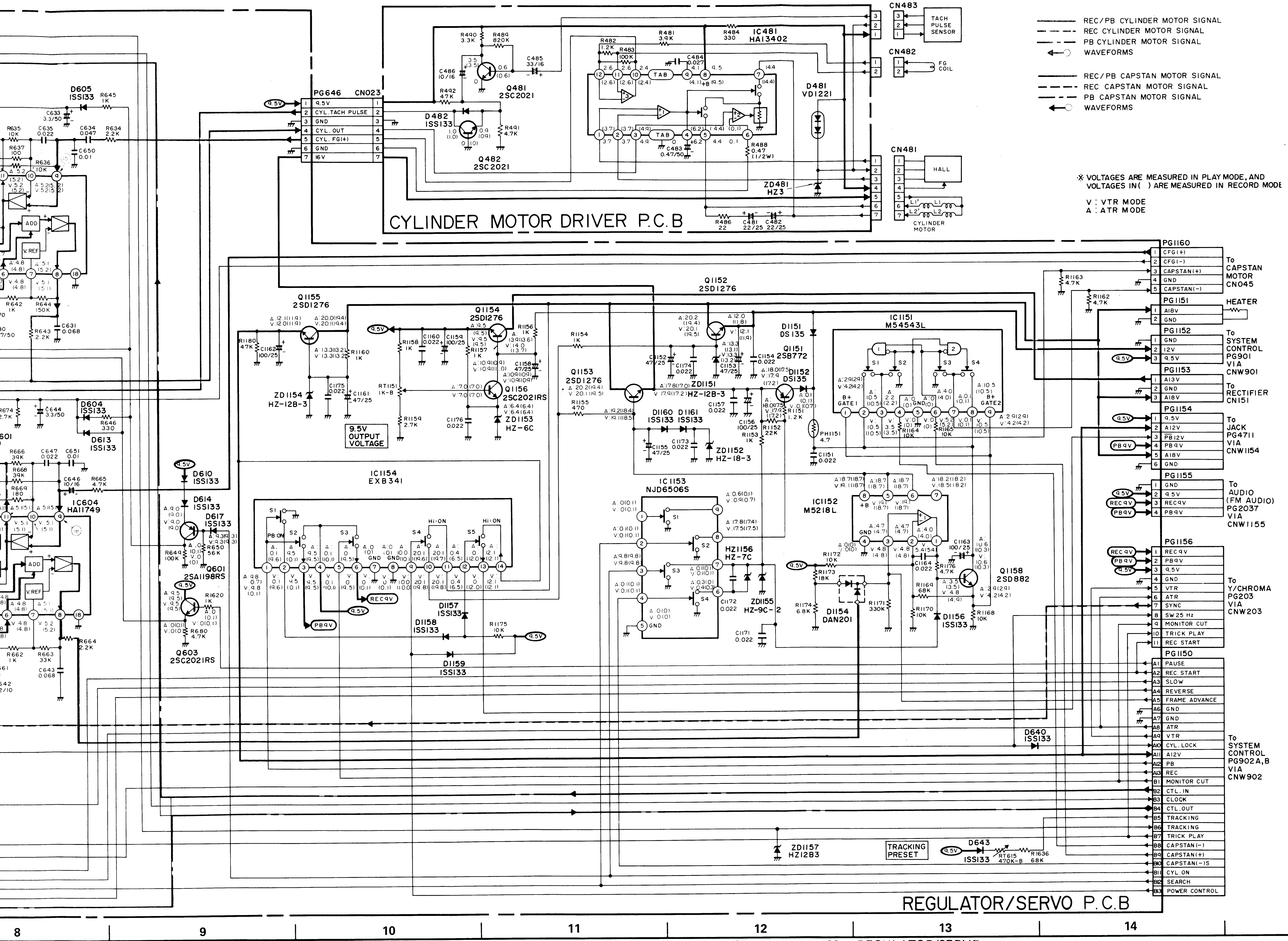
To SYSTEM CONTROL PG910

SCHEMATIC DIAGRAM GUIDE	PAGE (UK)/(E)
TUNER/IF	58/67
TUNER PACK	61/71
RF BOOSTER	62/70
V.S TUNING	63/73
MPX DEMODULATOR	− 77
JACK	81/85
Y/CHROMA	90/98
FM AUDIO	106/106
LINEAR AUDIO	115/115
OPERATION SW/ TAPE COUNTER DISPLAY	109/109
SYSTEM CONTROL	118/118
REGULATOR/SERVO	125/125
I.R RECEIVER	134/134
TIMER	135/135
RECTIFIER	139/139
RF CONVERTER	141/141

REGULATOR/SERVO


PG641
4.43MHz
GND
To Y/CHROMA PG206 VIA CNW206
CTL HEAD
PG648
CTL PULSE
GND
CN048
PG601
CTL OUT
FREE RUN
CYLINDER SPEED
GND
ATR SPEED
CAPSTAN SPEED
9.5V
REF. ADJ
SW25 Hz
TEST POINT
IC601 BA340
IC602 HA11747
IC603 HA11749
IC604 HA11749
IC605 HA11750
IC606 NJD6506S
IC607 NJD6506S
D601 ISS133
D602 ISS133
ZD601 HZ6A1
D605 ISS133
D606 ISS133
D607 DAN201
D609 DAN201
D611 ISS133
D691 ISS133
D604 ISS133
D613 ISS133
D612 ISS133
D618 DAN201
D619 ISS133
D620 ISS133
D621 ISS133
D625 ISS133
D626 ISS133
D628 ISS133
D631 DAN201
D632 DAN201
D633 DAN201
D634 ISS133
D636 DAN201
D638 ISS133
D639 ISS133
D644 ISS133
D645 ISS133
D646 ISS133
D672 ISS133
Q605 2SA1198RS
Q606 2SA1198RS
Q613 2SC2021RS
Q614 2SC2021
Q615 2SC2021
Q616 2SC2021RS
Q617 2SC2021RS
TP601
TP602
TP603
TP604
TP605
RT602 NORMAL CH2 PHASE
RT603 NORMAL CH1 PHASE
PWM GEN
1/8
REF COUNTER
NOISE REJ COUNTER
TRACKING MM
REC AMP
VD DET
VD SEP
CYLINDER PHASE DET COUNTER
CAPSTAN PHASE DET COUNTER
CFG DIVIDER
MM2
MM1
TACH DET
SW 30
PB/REC
CURRENT SOURCE
SAWING
S/H
PULSE GEN
DOUBLER
ADD
V.REF
MODE DET
CYLINDER SPEED
CAPSTAN SPEED
RA601
TRAPE
PG
TRIG
CH2 MM
CH1 MM
WIDTH MM
MOD
V. SYNC
ATR MODE REVERSE VISUAL SEARCH SPEED
VTR MODE FORWARD VISUAL SEARCH SPEED
VTR MODE REVERSE VISUAL SEARCH SPEED
REC9V
9.5V
E
D
C
B
A
1
2
3
4
5
6
7
8


CYLINDER MOTOR DRIVER P.C.B
IC602 HA11747
IC603 HA11749
IC604 HA11749
IC606 NJD6506S
IC607 NJD6506S
IC1153 NJD6506S
IC1154 EXB341
PG646 CN023
9.5V
CYL. TACH PULSE
GND
CYL. OUT
CYL. FG(+)
GND
16V
PWM GEN
1/8
REF COUNTER
NOISE REJ COUNTER
TRACKING MM
REC AMP
VD DET
VD SEP
CYLINDER PHASE DET COUNTER
CAPSTAN PHASE DET COUNTER
CFG DIVIDER
MM2
MM1
TACH DET
SW 30
PB/REC
CURRENT SOURCE
SAWING
S/H
PULSE GEN
DOUBLER
V.REF
ADD
MODE DET
RT602 NORMAL CH2 PHASE
RT603 NORMAL CH1 PHASE
CYLINDER SPEED
CAPSTAN SPEED
VTR MODE FORWARD VISUAL SEARCH SPEED
VTR MODE REVERSE VISUAL SEARCH SPEED
9.5V OUTPUT VOLTAGE
TP601
TP602
TP603
TP604
RA601
Q481 2SC2021
Q482 2SC2021
Q601 2SA1198RS
Q603 2SC2021RS
Q605 2SA1198RS
Q606 2SA1198RS
Q613 2SC2021RS
Q614 2SC2021
Q615 2SC2021
Q616 2SC2021RS
Q617 2SC2021RS
Q1153 2SD1276
Q1154 2SD1276
Q1155 2SD1276
Q1156 2SC2021RS
D482 ISS133
D604 ISS133
D605 ISS133
D606 ISS133
D607 DAN201
D609 DAN201
D610 ISS133
D611 ISS133
D613 ISS133
D614 ISS133
D617 ISS133
D619 ISS133
D620 ISS133
D621 ISS133
D631 DAN201
D632 DAN201
D633 DAN201
D634 ISS133
D636 DAN201
D639 ISS133
D645 ISS133
D691 ISS133
D1157 ISS133
D1158 ISS133
D1159 ISS133
D1160 ISS133
D1161 ISS133
ZD1151 HZ-12B-3
ZD1153 HZ-6C
ZD1154 HZ-12B-3
REC9V
PB9V
4
5
6
7
8
9
10
11


CYLINDER MOTOR DRIVER P.C.B
REGULATOR/SERVO P.C.B
PG646 CN023
9.5V
CYL.TACH PULSE
GND
CYL. OUT
CYL. FG(+)
GND
16V
IC481 HA13402
Q481 2SC2021
Q482 2SC2021
D482 ISS133
D481 VD1221
ZD481 HZ3
CN483
TACH PULSE SENSOR
CN482
FG COIL
CN481
HALL
CYLINDER MOTOR
TAB
PG1160
CFG(+)
CFG(-)
CAPSTAN(+)
GND
CAPSTAN(-)
To CAPSTAN MOTOR CN045
PG1151
A18V
GND
HEATER
PG1152
GND
12V
9.5V
To SYSTEM CONTROL PG901 VIA CNW901
PG1153
A13V
GND
A18V
To RECTIFIER CN151
PG1154
9.5V
A12V
PB12V
PB9V
A18V
GND
To JACK PG4711 VIA CNW1154
PG1155
GND
9.5V
REC9V
PB9V
To AUDIO (FM AUDIO) PG2037 VIA CNW1155
PG1156
REC9V
PB9V
9.5V
GND
VTR
ATR
SYNC
SW25 Hz
MONITOR CUT
TRICK PLAY
REC START
To Y/CHROMA PG203 VIA CNW203
PG1150
PAUSE
REC START
SLOW
REVERSE
FRAME ADVANCE
GND
GND
ATR
VTR
CYL. LOCK
A12V
PB
REC
MONITOR CUT
CTL. IN
CLOCK
CTL. OUT
TRACKING
TRACKING
TRICK PLAY
CAPSTAN(-)
CAPSTAN(+)
CAPSTAN(-)S
CYL. ON
SEARCH
POWER CONTROL
To SYSTEM CONTROL PG902A,B VIA CNW902
Q1155 2SD1276
Q1154 2SD1276
Q1152 2SD1276
Q1153 2SD1276
Q1151 2SB772
Q1156 2SC202IRS
Q1158 2SD882
9.5V OUTPUT VOLTAGE
IC1151 M54543L
IC1152 M5218L
IC1153 NJD6506S
IC1154 EXB341
IC604 HA11749
D1151 DS135
D1152 DS135
D1154 DAN201
D1156 ISS133
D1157 ISS133
D1158 ISS133
D1159 ISS133
D1160 ISS133
D1161 ISS133
D640 ISS133
D643 ISS133
ZD1151 HZ-12B-3
ZD1152 HZ-18-3
ZD1153 HZ-6C
ZD1154 HZ-12B-3
ZD1155 HZ-9C-2
HZ1156 HZ-7C
ZD1157 HZ12B3
PH1151 4.7
TRACKING PRESET
RT615 470K-B
R1636 68K
B+ GATE1
B+ GATE2
REC9V
PB9V
Q601 2SA1198RS
Q603 2SC202IRS
D604 ISS133
D605 ISS133
D610 ISS133
D613 ISS133
D614 ISS133
D617 ISS133
ADD
V.REF
8
9
10
11
12
13
14
15
16

REC/PB CYLINDER MOTOR SIGNAL
REC CYLINDER MOTOR SIGNAL
PB CYLINDER MOTOR SIGNAL
WAVEFORMS

REC/PB CAPSTAN MOTOR SIGNAL
REC CAPSTAN MOTOR SIGNAL
PB CAPSTAN MOTOR SIGNAL
WAVEFORMS

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN( ) ARE MEASURED IN RECORD MODE

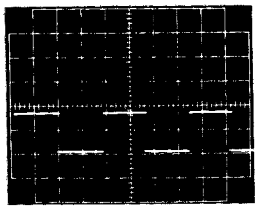
V : VTR MODE
A : ATR MODE

SCHEMATIC DIAGRAM GUIDE	PAGE (UK)/(E)
TUNER/IF	58/67
TUNER PACK	61/71
RF BOOSTER	62/70
V.S TUNING	63/73
MPX DEMODULATOR	— 77
JACK	81/85
Y/CHROMA	90/98
FM AUDIO	106/106
LINEAR AUDIO	115/115
OPERATION SW/ TAPE COUNTER DISPLAY	109/109
SYSTEM CONTROL	118/118
REGULATOR/SERVO	125/125
I.R RECEIVER	134/134
TIMER	135/135
RECTIFIER	139/139
RF CONVERTER	141/141

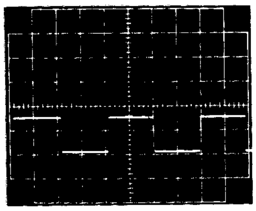
SERVO CIRCUIT WAVEFORMS

[IC602]

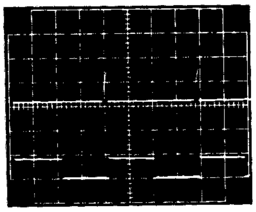
① PIN1 PB/REC
5V/0.5 ms. div.



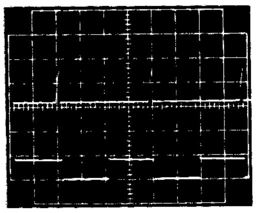
② PIN5 REC
1V/0.5 ms. div.



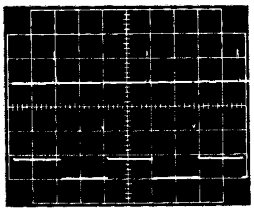
③ PIN11 PB/REC
CH1, 2V/10 ms. div.
CH2 (SW25) 2V/10 ms. div.



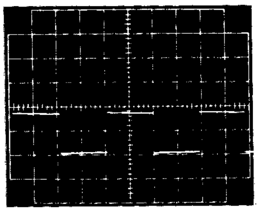
④ PIN12 PB/REC
CH1, 2V/10 ms. div.
CH2 (SW25) 2V/10 ms. div.



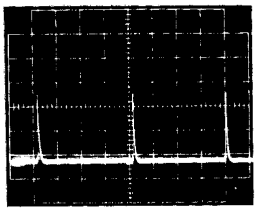
⑤ PIN13 PB/REC
CH1, 2V div/10 ms. div.
CH2 (SW25) 2V/10 ms. div.



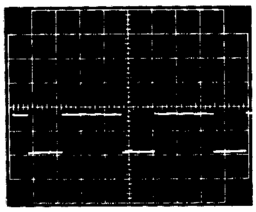
⑥ PIN14 PB/REC
5V/10 ms. div.



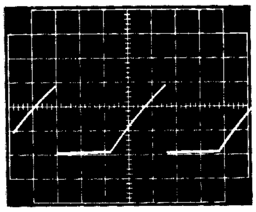
⑦ PIN16 REC
0.5V/5 ms. div.



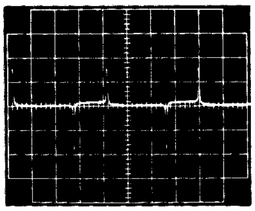
⑧ PIN17 PB
5V/10 ms. div.



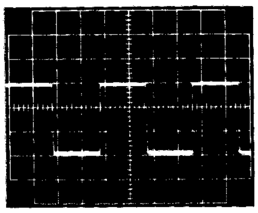
⑨ PIN18 PB
1V/10 ms. div.



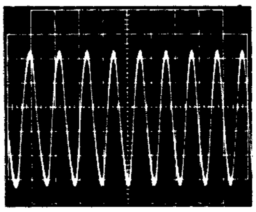
⑩ PIN20 PB
2V/10 ms. div.



⑪ PIN24 PB/REC
50 mV/10 μs. div.

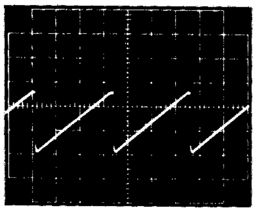


⑫ PIN28 PB/REC
2V/0.2 μs. div.

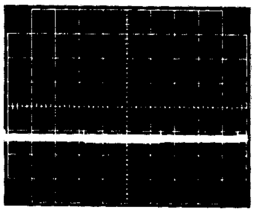


[IC603]

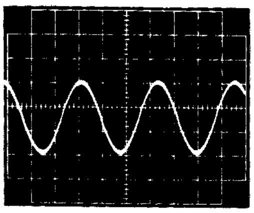
⑬PIN2 PB/REC
2V/0.2 ms. div.



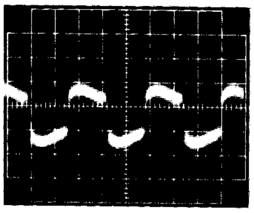
⑭PIN3 PB/REC
50mV/0.2 ms. div.



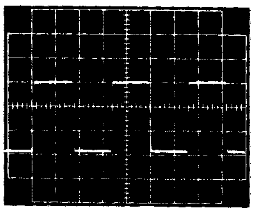
⑮PIN9 PB/REC
0.1V/0.2 ms. div.



⑯PIN10 PB/REC
10mV/0.2 ms. div.

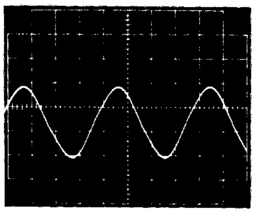


⑰PIN11 PB/REC (TP602)
0.5V/0.2 ms. div.

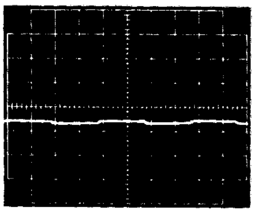


[IC604]

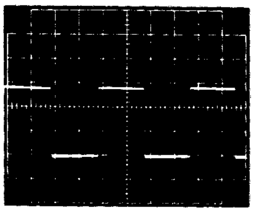
⑱PIN9 PB/REC
0.2V/0.5 ms.



⑲PIN10 PB/REC
0.2V/0.5 ms.

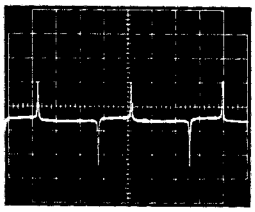


⑳PIN11 PB/REC (TP601)
0.5V/0.5 ms.

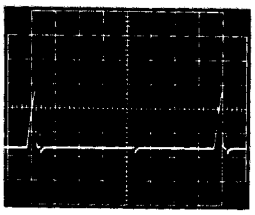


TEST PLUG

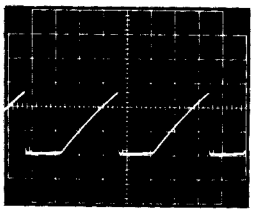
㉑PG601-PIN1 (TP603)
2V/10 ms. div.



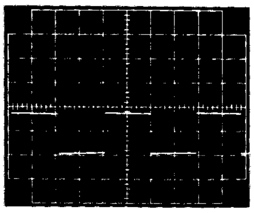
㉒PG601-PIN3
1V/5 ms. div.



㉓PG601-PIN6
1V/10 ms. div.



㉔PG601-PIN9(TP605)
2V/10 ms. div.



IC601

	VTR	ATR
1	1.9 (1.7)	1.9 (1.7)
2		
3	0.6(0.5)	0.6(0.5)
4	0.1(0.1)	0.1(0.1)
5	0 (0.1)	0 (0.1)
6	0.6(0.9)	0.7(0.9)
7	4.7(3.5)	4.6(3.5)
8	7.3(4.4)	7.3(4.4)

IC602

	VTR	ATR		VTR	ATR
28	4.7(4.7)	4.7(4.7)	1	4.8(4.8)	4.8(4.8)
27	0 (0.1)	0.1 (0.1)	2	0 (0.1)	0.1 (0.1)
26	0.5(0.1)	0.5 (0.5)	3	3.3(3.3)	0.1 (0.1)
25	5.5(5.5)	5.5(5.5)	4	2.5(2.5)	2.5(2.5)
24	2.4(2.4)	2.4(2.4)	5	2.5(2.5)	2.5(2.5)
23	9.5(9.5)	9.5(9.5)	6	0 (8.8)	0.1 (8.8)
22	0 (0)	0 (0.1)	7	0 (0)	0 (0)
21	1.0 (1.0)	1.0(1.0)	8	0 (0.1)	0.1(0.1)
20	0.5(1.2)	0.5(1.3)	9	1.8 (1.8)	1.8 (1.8)
19	0.1(0.1)	0.1(0.1)	10	1.4 (1.4)	1.4 (1.4)
18	0.9(0.7)	0.9 (1.2)	11	0.2(0.2)	0.2(0.2)
17	0.4 (6.0)	0.4 (6.0)	12	0.2(0.2)	0.2(0.2)
16	0.3(0.3)	0.3(0.3)	13	1.3 (1.3)	1.3 (1.3)
15	9.5(9.5)	9.5(9.5)	14	4.7(4.4)	4.7(4.4)

IC603

	VTR	ATR		VTR	ATR
			17	4.8 (4.8)	4.8 (4.8)
16	9.5(9.5)	9.5(9.5)	1	4.8(4.9)	4.8(4.9)
15	0.1(0.1)	0.1(0.1)	2	3.2 (3.2)	3.2(3.2)
14	0.8 (1.6)	0.8(2.0)	3	4.5 (4.5)	4.5 (4.5)
13	0.1(0.1)	0.1 (0.1)	4	4.8(4.8)	4.8(4.8)
12	5.2 (5.2)	5.2(5.2)	5	4.8(4.8)	4.8 (4.8)
11	5.2 (5.2)	5.2(5.2)	6	4.7(4.7)	4.7 (4.7)
10	5.2 (5.2)	5.2(5.2)	7	4.8(4.8)	4.8(4.8)
9	5.2(5.2)	5.2(5.2)	8	5.1(5.1)	5.1 (5.2)
			18	0	0

IC604

	VTR	ATR		VTR	ATR
			17	3.8(3.8)	2.0(2.0)
16	9.5(9.5)	9.5 (9.5)	1	3.8(3.8)	2.1(2.1)
15	0.1(0.1)	2.0(2.0)	2	3.4(3.4)	3.6(3.6)
14	3.8(3.8)	0.1 (0.1)	3	4.9 (4.9)	5.3(5.3)
13	0 (0.1)	7.8(7.8)	4	5.1(5.1)	5.4(5.4)
12	5.1 (5.1)	5.1 (5.1)	5	4.8(4.9)	4.9(4.9)
11	5.1 (5.1)	5.1 (5.1)	6	4.8(4.8)	4.8(4.8)
10	5.1 (5.1)	5.1(5.1)	7	4.8(4.8)	4.8(4.8)
9	5.1 (5.1)	5.1 (5.1)	8	5.2(5.2)	5.1 (5.1)
			18	0	0

IC606

	1	2	3	4	5	6	7	8	9
VTR	6.4 (6.4)	0 (0.1)	8.5 (8.5)	0 (0)	0 (0)	0.1(0.1)	0.1 (0.1)	6.9 (6.9)	0 (0.1)
ATR	6.4 (6.4)	0 (0.1)	0.1 (0.1)	0 (0.1)	0 (0.1)	8.4 (8.4)	8.4 (8.4)	6.9 (6.9)	0.1 (0.1)

IC1153

	1	2	3	4	5	6	7	8	9
VTR	0 (0.1)	0.1 (0.1)	9.8(9.8)	0.1 (0.1)	0 (0)	0.4(0.3)	0.1 (0.1)	17.5(17.5)	0.9(0.7)
ATR	0 (0.1)	0.1 (0.1)	9.8(9.8)	0.1 (0.1)	0 (0.1)	0.3 (0)	0.1 (0.1)	17.8(17.4)	0.6 (0.1)

IC1154

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
VTR	9.8 (0.1)	0.1(9.6)	9.5(0.1)	9.5(9.5)	0.1(10.1)	0 (9.5)	0 (0)	0 (0)	10.0(10.0)	20.1(19.8)	20.1 (19.8)	0.4 (6.5)	0 (12.0)	12.1 (12.1)
ATR	9.8(0.7)	0.1(9.6)	9.5 (0.1)	9.5(9.5)	0.1(10.1)	0.1(9.5)	0 (0.1)	0 (0.1)	10.0(10.1)	20.1(19.6)	20.1(19.7)	0.4 (6.5)	0 (12.0)	12.1(12.1)

IC605

	ATR	VTR		ATR	VTR
1	0 (0.1)	0 (0)	9	4.9 (4.9)	4.9(4.9)
2	2.3 (8.9)	2.3 (8.9)	10	9.4 (0.4)	1.0(9.4)
3	0.1 (0.1)	0.1 (0.1)	11	3.1 (7.5)	4.2 (7.5)
4	0.1 (0.1)	0.1 (0.1)	12	2.5(0.6)	4.7(0.2)
5	0.1 (0.1)	0.1 (0.1)	13	4.5(0.1)	4.5(0.1)
6	0.1 (0.1)	0 (0.1)	14	1.7 (0.1)	1.8(0.1)
7	0 (0.1)	0 (0)	15	2.1 (0.1)	2.1(0.1)
8	9.5 (9.5)	9.5 (9.5)	16	0.9 (1.0)	0.9 (1.0)

IC1151

	ATR	VTR
1	2.9(2.9)	4.2(4.2)
2	10.5(10.5)	10.5(10.5)
3	2.2(2.2)	3.5(3.5)
4	0 (0.1)	0 (0)
5	0 (0)	0 (0)
6	4.0 (4.0)	5.2 (5.2)
7	0.1 (0.1)	0.1(0.1)
8	10.5(10.5)	10.5(10.5)
9	2.9 (2.9)	4.2 (4.2)

IC1152

	ATR	VTR
1	4.0 (4.0)	5.4 (5.4)
2	4.7 (4.7)	4.8(4.8)
3	4.7 (4.7)	4.8(4.8)
4	0 (0)	0 (0)
5	18.7(18.7)	19.1(18.7)
6	18.7(18.7)	19.1(18.7)
7	18.2(18.2)	18.5(18.2)
8	18.7 (18.7)	19.1 (18.7)

Q601

	ATR	VTR
B	9.3(9.3)	9.3(9.3)
C	0 (0.1)	0 (0)
E	9.0(9.0)	9.0 (9.0)

Q603

	ATR	VTR
B	0 (0.1)	0 (0.1)
C	9.5 (9.5)	9.5(9.5)
E	0 (0.1)	0 (0)

IC607

	1	2	3	4	5	6	7	8	9
VTR	0 (0.1)	0 (0.1)	0 (0)	0 (0)	0 (0)	5.3(5.3)	3.8 (3.8)	5.3(5.3)	3.8 (3.8)
ATR	0.1 (0.1)	0.1 (0.1)	0 (0)	0 (0)	0 (0)	5.3(5.3)	3.8 (3.8)	5.3 (5.3)	3.8 (3.8)

Q605

	ATR	VTR
B	4.4 (4.4)	4.4 (4.4)
C	5.0 (5.0)	4.9 (5.0)
E	5.0 (5.0)	5.0(5.0)

Q606

	ATR	VTR
B	4.4 (4.4)	4.4 (4.4)
C	5.0(5.0)	4.9 (5.0)
E	5.0 (5.0)	5.0 (5.0)

Q613

	ATR	VTR
B	0.7 (0.7)	0 (0)
C	0.1 (0.1)	3.3 (3.3)
E	0 (0.1)	0 (0)

Q614

	ATR	VTR
B	0.7 (0.7)	0 (0.1)
C	0.1 (0.1)	8.5 (8.5)
E	0 (0.1)	0 (0)

Q615

	ATR	VTR
B	0 (0.7)	0 (0.7)
C	0 (0)	0 (0)
E	0 (0)	0 (0)

Q616

	ATR	VTR
B	0.1 (0.1)	5.8(5.8)
C	1.9 (1.9)	5.4(5.4)
E	0.2(0.4)	5.4 (5.4)

Q617

	ATR	VTR
B	0.1 (0.1)	5.8 (5.8)
C	1.9 (1.9)	5.3(5.3)
E	0.2 (0.5)	5.3(5.3)

Q1151

	ATR	VTR
B	17.9(17.5)	17.7(17.1)
C	0.1 (0.1)	0.1(0.7)
E	18.0(17.5)	17.9(17.2)

Q1152

	ATR	VTR
B	13.3 (13.1)	13.3(13.2)
C	20.2(19.4)	20.1(19.5)
E	12.0 (11.8)	12.1(11.9)

Q1153

	ATR	VTR
B	19.2 (18.4)	19.1(18.5)
C	20.2(19.4)	20.1(19.5)
E	17.8(17.0)	17.9(17.2)

Q1154

	ATR	VTR
B	10.9(10.9)	10.9 (11.0)
C	13.9(13.6)	14.0 (13.7)
E	9.5 (9.5)	9.5 (9.5)

Q1155

	ATR	VTR
B	13.3(13.2)	13.3(13.2)
C	20.0(19.4)	20.1(19.4)
E	12.1 (11.9)	12.0(11.9)

Q1156

	ATR	VTR
B	7.0(7.0)	7.0 (7.0)
C	10.9(10.9)	10.9(10.9)
E	6.4 (6.4)	6.4 (6.4)

Q1158

	ATR	VTR
B	3.5 (3.5)	4.8 (4.9)
C	10.6(10.3)	10.6(10.3)
E	2.9 (2.9)	4.2 (4.2)

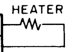
PG1150

	A		B
1	PAUSE	1	MONITOR CUT
2	REC START	2	CTL. IN
3	SLOW	3	CLOCK
4	REVERSE	4	CTL. OUT
5	F. ADV	5	TRACKING
6	GND	6	TRACKING
7	GND	7	TRICK PLAY
8	ATR	8	CAPSTAN (−)
9	VTR	9	CAPSTAN (+)
10	CYL. LOCK	10	CAPSTAN (−)S
11	A12V	11	CYL. ON
12	PB	12	SEARCH
13	REC	13	POWER CONTROL

To
SYSTEM CONTROL
PG902 A, B
VIA
CNW902

PG1151

1	A18V
2	GND



PG1152

1	GND
2	12V
3	9.5V

To
SYSTEM CONTROL
PG901
VIA
CNW901

PG1153

1	A13V
2	GND
3	A18V

To
RECTIFIER
CN151

PG1154

1	9.5V
2	A12V
3	$\overline{\text{PB}}$12V
4	PB9V
5	A18V
6	GND

To
JACK
PG4711
VIA
CNW1154

PG1155

1	GND
2	9.5V
3	REC9V
4	PB9V

To
AUDIO
PG2037
VIA
CNW1155

PG1156

1	REC9V
2	PB9V
3	9.5V
4	GND
5	VTR
6	ATR
7	SYNC
8	SW25Hz
9	MONITOR CUT
10	TRICK PLAY
11	REC START

To
Y/CHROMA
PG203 VIA
CNW203

PG1160

1	CFG(+)
2	CFG(−)
3	CAPSTAN(+)
4	GND
5	CAPSTAN(−)

To
CAPSTAN
MOTOR
CN045

PG601

1	CTL. OUT
2	FREE RUN
3	CYLINDER SPEED
4	GND
5	ATR SPEED
6	CAPSTAN SPEED
7	9.5V
8	REF. ADJ
9	SW25Hz

TEST POINT

PG641

1	4.43MHz
2	GND

To
Y/CHROMA
PG206 VIA
CNW206

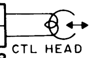
PG646

1	9.5V
2	CYL. TACH PULSE
3	GND
4	CYL. OUT
5	CYL FG(+)
6	GND
7	16V

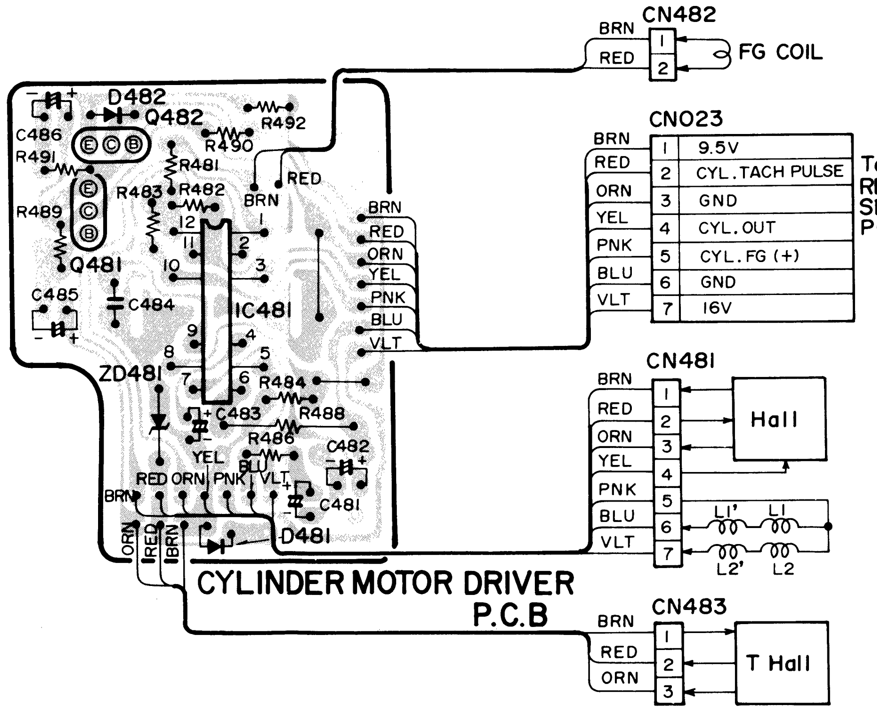
To
CYLINDER
MOTOR
DRIVER
CN023

PG648

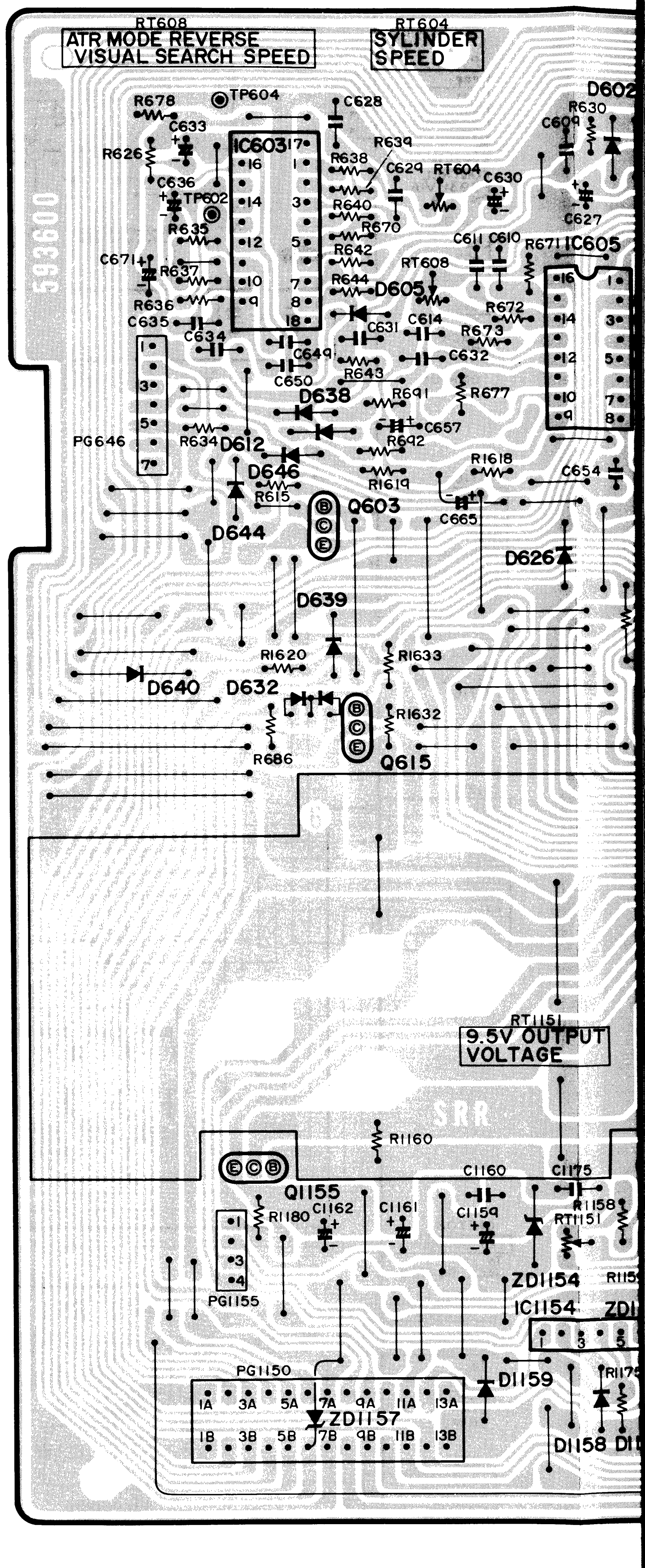
1	CTL PULSE
2	GND


CTL HEAD
CN048

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND
VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.


CN482
BRN
RED
1
2
FG COIL
D482
Q482
R492
R490
C486
R491
R481
R483
R482
R489
Q481
RED
BRN
C485
C484
IC481
ZD481
R484
C483
R488
R486
C482
YEL
RED ORN PNK BLU VLT
C481
D481
BRN
ORN RED BRN
BRN
RED
ORN
YEL
PNK
BLU
VLT
CN023
1 9.5V
2 CYL. TACH PULSE
3 GND
4 CYL. OUT
5 CYL. FG (+)
6 GND
7 16V
To
REGULATOR/
SERVO
PG646
CN481
Hall
L1'
L1
L2'
L2
CN483
T Hall

CYLINDER MOTOR DRIVER
P.C.B


RT608
ATR MODE REVERSE VISUAL SEARCH SPEED
RT604
SYLINDER SPEED
D602
R678
TP604
C628
R630
C633
C609
R626
IC603
R638
R639
C629
RT604
C630
C636
TP602
R640
C627
R635
R670
C611
C610
R671
IC605
R642
C671
R637
RT608
R644
D605
R636
R672
C635
C631
C614
R673
C634
C632
C649
R643
C650
D638
R691
R677
PG646
R634
D612
R692
C657
R1618
D646
R1619
C654
R615
Q603
D644
C665
D626
593600
D639
R1620
R1633
D640
D632
R1632
R686
Q615
RT1151
9.5V OUTPUT VOLTAGE
SRR
R1160
Q1155
C1160
C1175
R1180
C1162
C1161
C1159
R1158
RT1151
PG1155
ZD1154
R115
IC1154
ZD
PG1150
1A 3A 5A 7A 9A 11A 13A
1B 3B 5B 7B 9B 11B 13B
ZD1157
D1159
R117
D1158
D

06

	2	3	4	5	6	7	8	9
6.4)	0 (0.1)	8.5 (8.5)	0 (0)	0 (0)	0.1(0.1)	0.1 (0.1)	6.9 (6.9)	0 (0.1)
6.4)	0 (0.1)	0.1 (0.1)	0 (0.1)	0 (0.1)	8.4 (8.4)	8.4 (8.4)	6.9 (6.9)	0.1 (0.1)

53

	2	3	4	5	6	7	8	9
0.1)	0.1 (0.1)	9.8 (9.8)	0.1 (0.1)	0 (0)	0.4 (0.3)	0.1 (0.1)	17.5 (17.5)	0.9 (0.7)
0.1)	0.1 (0.1)	9.8 (9.8)	0.1 (0.1)	0 (0.1)	0.3 (0)	0.1 (0.1)	17.8 (17.4)	0.6 (0.1)

	7	8	9	10	11	12	13	14
.5)	0 (0)	0 (0)	10.0 (10.0)	20.1 (19.8)	20.1 (19.8)	0.4 (6.5)	0 (12.0)	12.1 (12.1)
.5)	0 (0.1)	0 (0.1)	10.0 (10.1)	20.1 (19.6)	20.1 (19.7)	0.4 (6.5)	0 (12.0)	12.1 (12.1)

07

	2	3	4	5	6	7	8	9
0.1)	0 (0.1)	0 (0)	0 (0)	0 (0)	5.3 (5.3)	3.8 (3.8)	5.3 (5.3)	3.8 (3.8)
0.1)	0.1 (0.1)	0 (0)	0 (0)	0 (0)	5.3 (5.3)	3.8 (3.8)	5.3 (5.3)	3.8 (3.8)

Q614

	ATR	VTR
B	0.7 (0.7)	0 (0.1)
C	0.1 (0.1)	8.5 (8.5)
E	0 (0.1)	0 (0)

Q615

	ATR	VTR
B	0 (0.7)	0 (0.7)
C	0 (0)	0 (0)
E	0 (0)	0 (0)

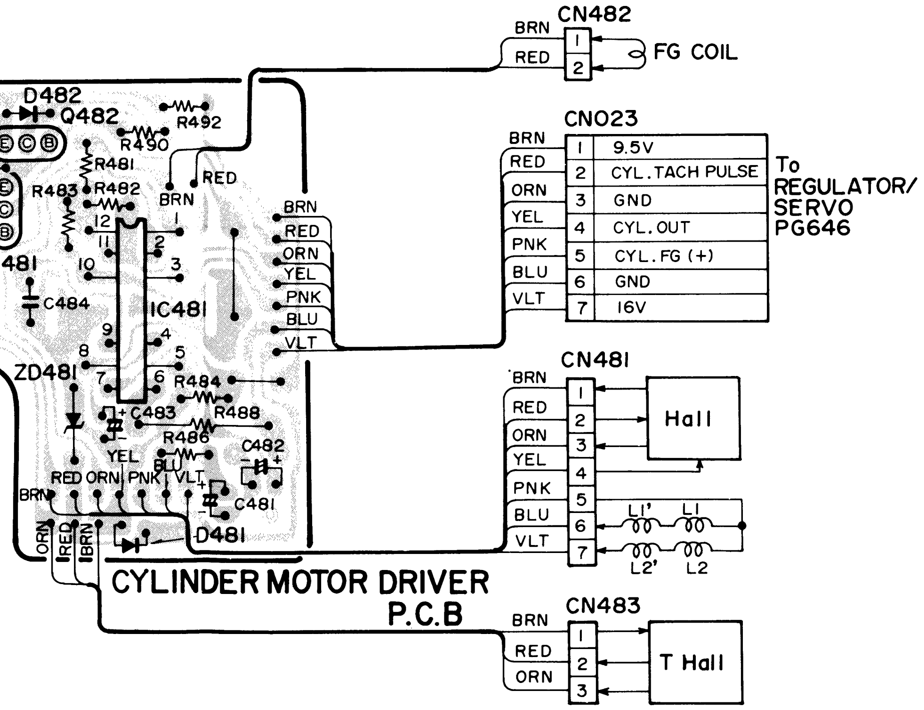
Q616

	ATR	VTR
B	0.1 (0.1)	5.8 (5.8)
C	1.9 (1.9)	5.4 (5.4)
E	0.2 (0.4)	5.4 (5.4)

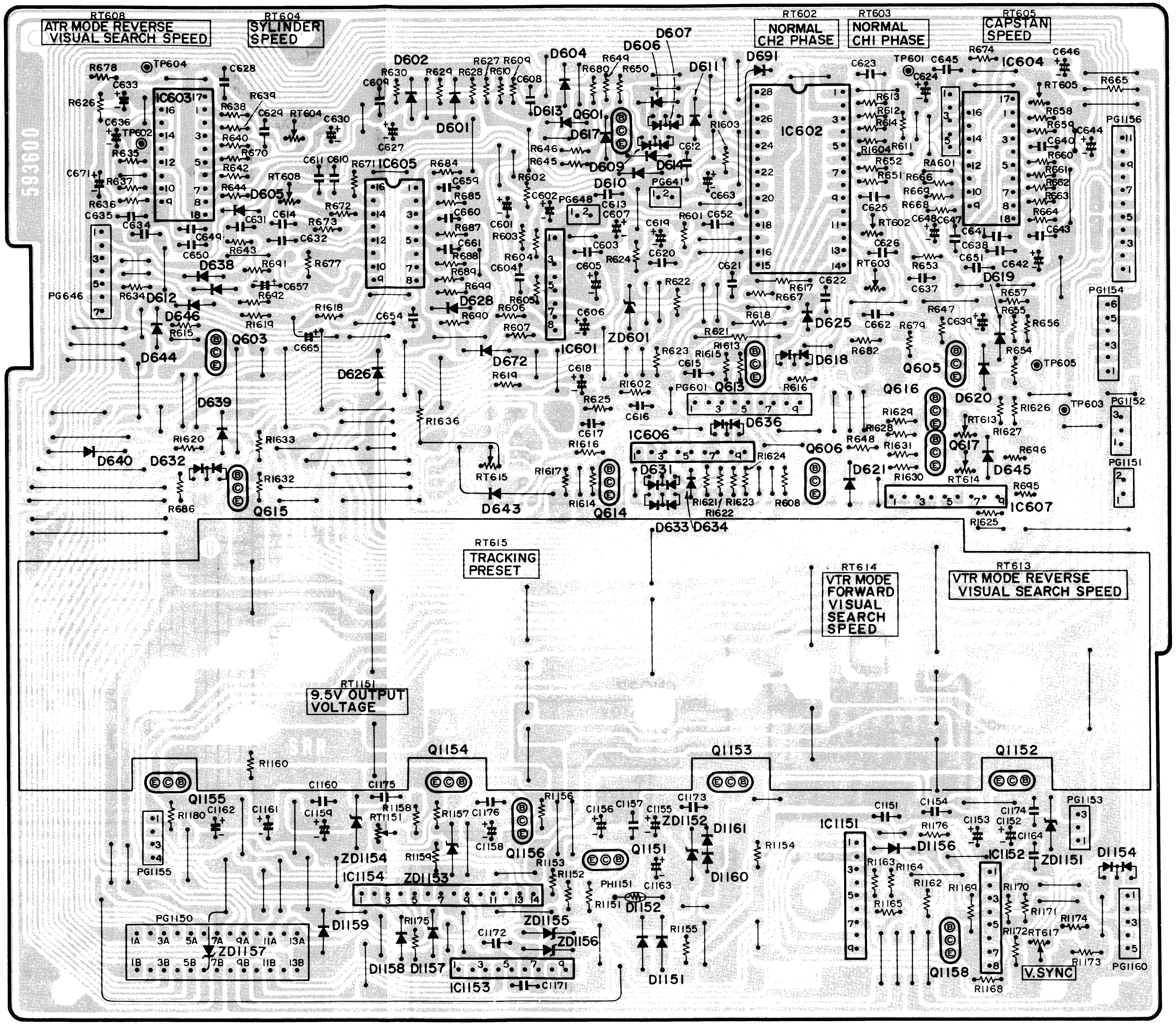
R
7.0)
0.9)
6.4)

Q1158

	ATR	VTR
B	3.5 (3.5)	4.9 (4.9)
C	10.6 (10.3)	10.6 (10.3)
E	2.9 (2.9)	4.2 (4.2)

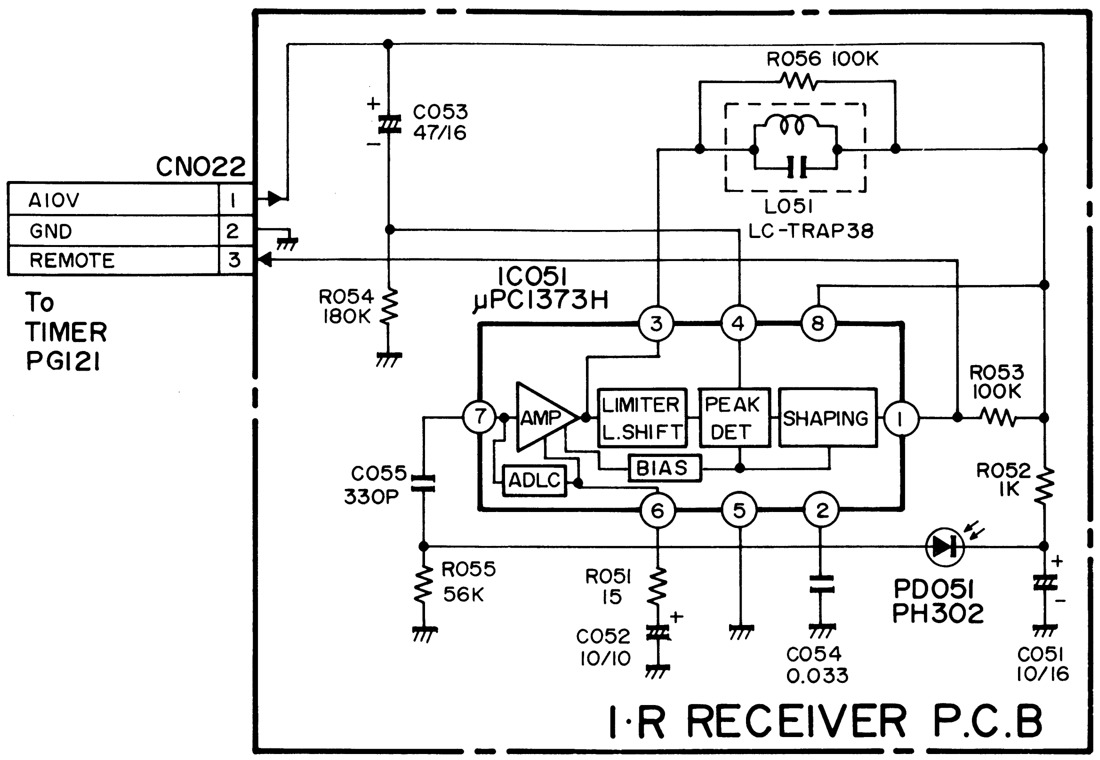

CN482
BRN
RED
FG COIL
CN023
BRN
RED
ORN
YEL
PNK
BLU
VLT
1 9.5V
2 CYL.TACH PULSE
3 GND
4 CYL.OUT
5 CYL.FG (+)
6 GND
7 16V
To REGULATOR/SERVO PG646
CN481
Hall
L1'
L1
L2'
L2
CN483
T Hall
D482
Q482
R492
R490
R481
R483
R482
RED
BRN
IC481
C484
ZD481
C483
R484
R488
R486
C482
C481
D481
YEL
RED ORN PNK BLU VLT

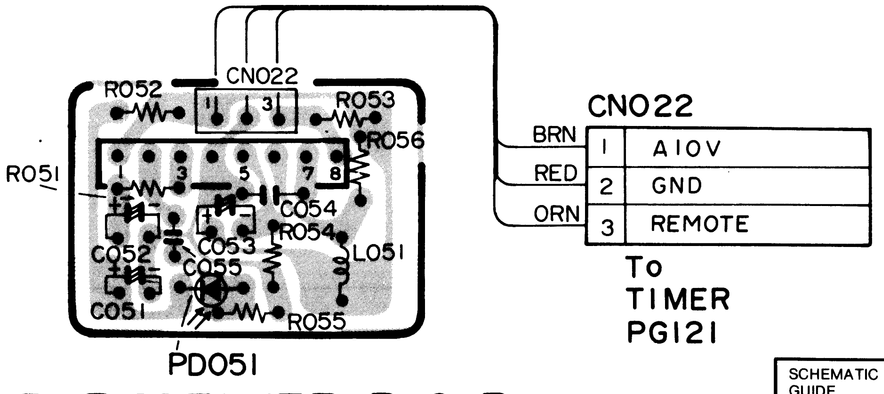
CYLINDER MOTOR DRIVER P.C.B


RT608
ATR MODE REVERSE VISUAL SEARCH SPEED
RT604
SYLINDER SPEED
RT602
NORMAL CH2 PHASE
RT603
NORMAL CH1 PHASE
RT605
CAPSTAN SPEED
593600
IC603
IC605
IC601
IC602
IC604
IC606
IC607
TP604
TP602
TP601
TP605
TP603
PG646
PG641
PG648
PG601
PG1156
PG1154
PG1152
PG1151
Q601
Q603
Q605
Q606
Q613
Q614
Q615
Q616
Q617
D602
D604
D606
D607
D611
D691
D601
D609
D610
D612
D613
D614
D617
D618
D619
D620
D621
D625
D626
D628
D631
D632
D633
D634
D636
D638
D639
D640
D643
D644
D645
D646
D672
ZD601
RT615
TRACKING PRESET
RT614
VTR MODE FORWARD VISUAL SEARCH SPEED
RT613
VTR MODE REVERSE VISUAL SEARCH SPEED
RT1151
9.5V OUTPUT VOLTAGE
Q1154
Q1153
Q1152
Q1155
Q1156
Q1151
Q1158
IC1151
IC1152
IC1153
IC1154
ZD1151
ZD1152
ZD1153
ZD1154
ZD1155
ZD1156
ZD1157
D1151
D1152
D1154
D1156
D1157
D1158
D1159
D1160
D1161
PH1151
PG1150
PG1153
PG1155
PG1160
RT617
V.SYNC
1A 3A 5A 7A 9A 11A 13A
1B 3B 5B 7B 9B 11B 13B

REGULATOR/SERVO P.C.B

I·R RECEIVER

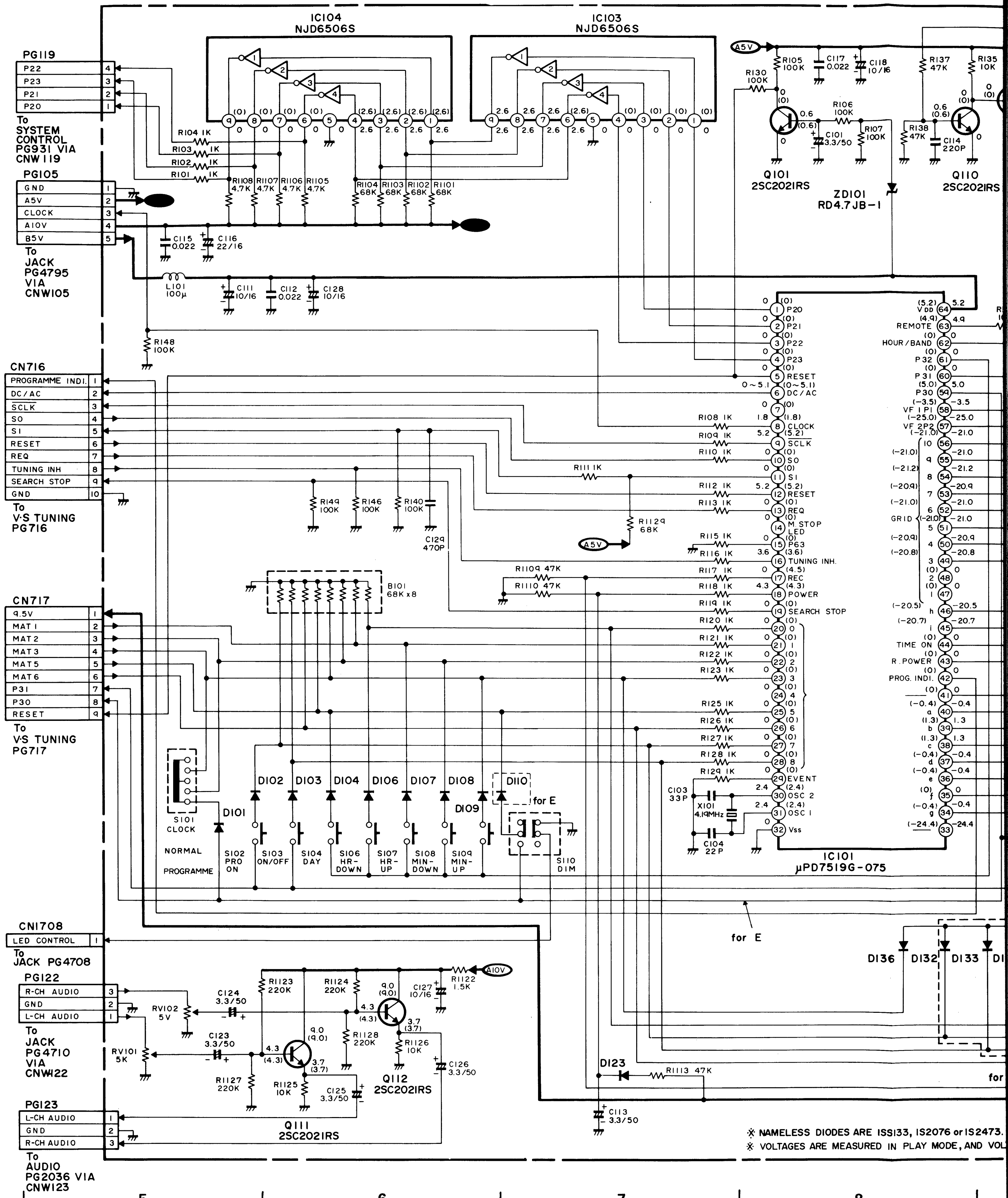

CN022
A10V 1
GND 2
REMOTE 3
To TIMER PG121
C053 47/16
R056 100K
L051 LC-TRAP38
R054 180K
IC051 μPC1373H
AMP
LIMITER L.SHIFT
PEAK DET
SHAPING
ADLC
BIAS
R053 100K
R052 1K
C055 330P
R055 56K
R051 15
C052 10/10
C054 0.033
PD051 PH302
C051 10/16
I·R RECEIVER P.C.B


CN022
R052
R053
R056
R051
C052
C053
C054
R054
L051
C055
C051
R055
PD051
BRN
RED
ORN
1 A10V
2 GND
3 REMOTE
To TIMER PG121

I·R RECEIVER P.C.B

SCHEMATIC DIAGRAM GUIDE	PAGE (UK)/(E)
TUNER/IF	58/67
TUNER PACK	61/71
RF BOOSTER	62/70
V.S TUNING	63/73
MPX DEMODULATOR	– 77
JACK	81/85
Y/CHROMA	90/98
FM AUDIO	106/106
LINEAR AUDIO	115/115
OPERATION SW/ TAPE COUNTER DISPLAY	109/109
SYSTEM CONTROL	118/118
REGULATOR/SERVO	125/125
I.R RECEIVER	134/134
TIMER	135/135
RECTIFIER	139/139
RF CONVERTER	141/141

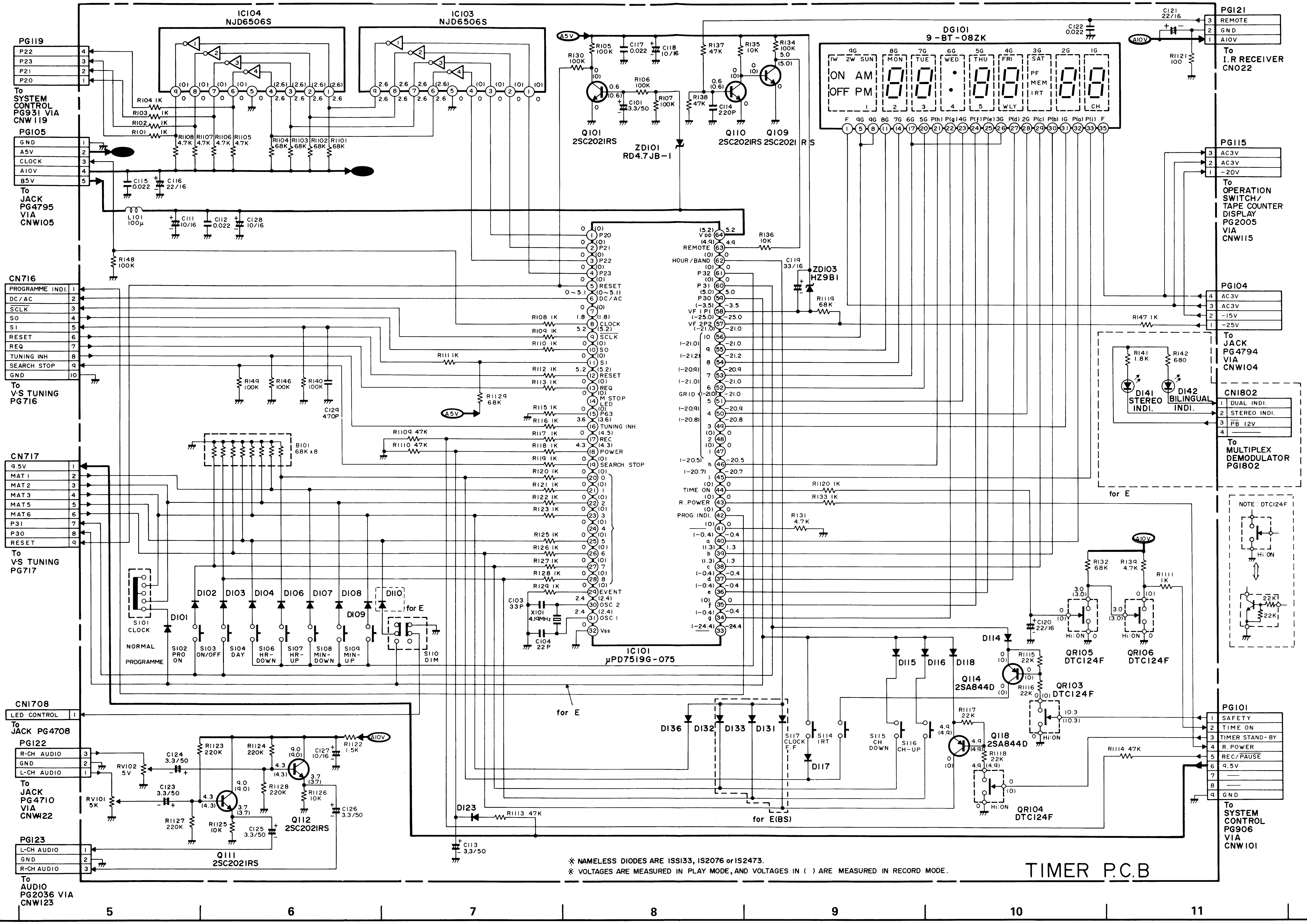
TIMER


IC104 NJD6506S
IC103 NJD6506S
PG119
P22 4
P23 3
P21 2
P20 1
To SYSTEM CONTROL PG931 VIA CNW119
PG105
GND 1
A5V 2
CLOCK 3
A10V 4
B5V 5
To JACK PG4795 VIA CNW105
R104 1K
R103 1K
R102 1K
R101 1K
R1108 4.7K
R1107 4.7K
R1106 4.7K
R1105 4.7K
R1104 68K
R1103 68K
R1102 68K
R1101 68K
C115 0.022
C116 22/16
L101 100μ
C111 10/16
C112 0.022
C128 10/16
R148 100K
A5V
R105 100K
C117 0.022
C118 10/16
R130 100K
Q101 2SC2021RS
R106 100K
C101 3.3/50
R107 100K
ZD101 RD4.7JB-1
R137 47K
R135 10K
R138 47K
C114 220P
Q110 2SC2021RS
CN716
PROGRAMME INDI. 1
DC/AC 2
SCLK 3
SO 4
SI 5
RESET 6
REQ 7
TUNING INH 8
SEARCH STOP 9
GND 10
To V·S TUNING PG716
R149 100K
R146 100K
R140 100K
C129 470P
R111 1K
R1129 68K
A5V
R1109 47K
R1110 47K
B101 68K x 8
CN717
9.5V 1
MAT1 2
MAT2 3
MAT3 4
MAT5 5
MAT6 6
P31 7
P30 8
RESET 9
To V·S TUNING PG717
S101 CLOCK
NORMAL
PROGRAMME
D101
D102
D103
D104
D106
D107
D108
D109
D110
for E
S102 PRO ON
S103 ON/OFF
S104 DAY
S106 HR-DOWN
S107 HR-UP
S108 MIN-DOWN
S109 MIN-UP
S110 DIM
R108 1K
R109 1K
R110 1K
R112 1K
R113 1K
R115 1K
R116 1K
R117 1K
R118 1K
R119 1K
R120 1K
R121 1K
R122 1K
R123 1K
R125 1K
R126 1K
R127 1K
R128 1K
R129 1K
C103 33P
X101 4.19MHz
C104 22P
P20
P21
P22
P23
RESET
DC/AC
CLOCK
SCLK
SO
SI
RESET
REQ
M STOP
LED
P63
TUNING INH.
REC
POWER
SEARCH STOP
EVENT
OSC 2
OSC 1
Vss
VDD
REMOTE
HOUR/BAND
P32
P31
P30
VF1P1
VF2P2
GRID
TIME ON
R.POWER
PROG. INDI.
IC101 μPD7519G-075
for E
CN1708
LED CONTROL 1
To JACK PG4708
PG122
R-CH AUDIO 3
GND 2
L-CH AUDIO 1
To JACK PG4710 VIA CNW122
RV102 5V
RV101 5K
C124 3.3/50
C123 3.3/50
R1123 220K
R1124 220K
R1127 220K
R1125 10K
C125 3.3/50
R1128 220K
R1126 10K
C126 3.3/50
C127 10/16
R1122 1.5K
A10V
Q112 2SC2021RS
Q111 2SC2021RS
PG123
L-CH AUDIO 1
GND 2
R-CH AUDIO 3
To AUDIO PG2036 VIA CNW123
D123
R1113 47K
C113 3.3/50
D136
D132
D133
for

※ NAMELESS DIODES ARE ISS133, IS2076 or IS2473.

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOL

TIMER



IC104 NJD6506S
IC103 NJD6506S
DG101 9-BT-08ZK
PG119
P22
P23
P21
P20
To SYSTEM CONTROL PG931 VIA CNW119
PG105
GND
A5V
CLOCK
A10V
B5V
To JACK PG4795 VIA CNW105
CN716
PROGRAMME INDI.
DC/AC
SCLK
SO
SI
RESET
REQ
TUNING INH
SEARCH STOP
GND
To V·S TUNING PG716
CN717
9.5V
MAT1
MAT2
MAT3
MAT5
MAT6
P31
P30
RESET
To V·S TUNING PG717
CN1708
LED CONTROL
To JACK PG4708
PG122
R-CH AUDIO
GND
L-CH AUDIO
To JACK PG4710 VIA CNW122
PG123
L-CH AUDIO
GND
R-CH AUDIO
To AUDIO PG2036 VIA CNW123
PG121
REMOTE
GND
A10V
To I.R RECEIVER CN022
PG115
AC3V
AC3V
-20V
To OPERATION SWITCH/ TAPE COUNTER DISPLAY PG2005 VIA CNW115
PG104
AC3V
AC3V
-15V
-25V
To JACK PG4794 VIA CNW104
CN1802
DUAL INDI.
STEREO INDI.
PB 12V
To MULTIPLEX DEMODULATOR PG1802
PG101
SAFETY
TIME ON
TIMER STAND-BY
R.POWER
REC/PAUSE
9.5V
GND
To SYSTEM CONTROL PG906 VIA CNW101
IC101 μPD7519G-075
Q101 2SC2021RS
Q110 2SC2021RS
Q109 2SC2021RS
ZD101 RD4.7JB-1
ZD103 HZ9B1
Q111 2SC2021RS
Q112 2SC2021RS
Q114 2SA844D
Q118 2SA844D
QR103 DTC124F
QR104 DTC124F
QR105 DTC124F
QR106 DTC124F
D141 STEREO INDI.
D142 BILINGUAL INDI.
S101 CLOCK NORMAL PROGRAMME
S102 PRO ON
S103 ON/OFF
S104 DAY
S106 HR-DOWN
S107 HR-UP
S108 MIN-DOWN
S109 MIN-UP
S110 DIM
S114 IRT
S115 CH DOWN
S116 CH-UP
S117 CLOCK F.F
B101 68K x8
X101 4.19MHz
for E
for E(BS)
NOTE: DTC124F
TIMER P.C.B

※ NAMELESS DIODES ARE 1SS133, 1S2076 or 1S2473.

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

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K)/(E)
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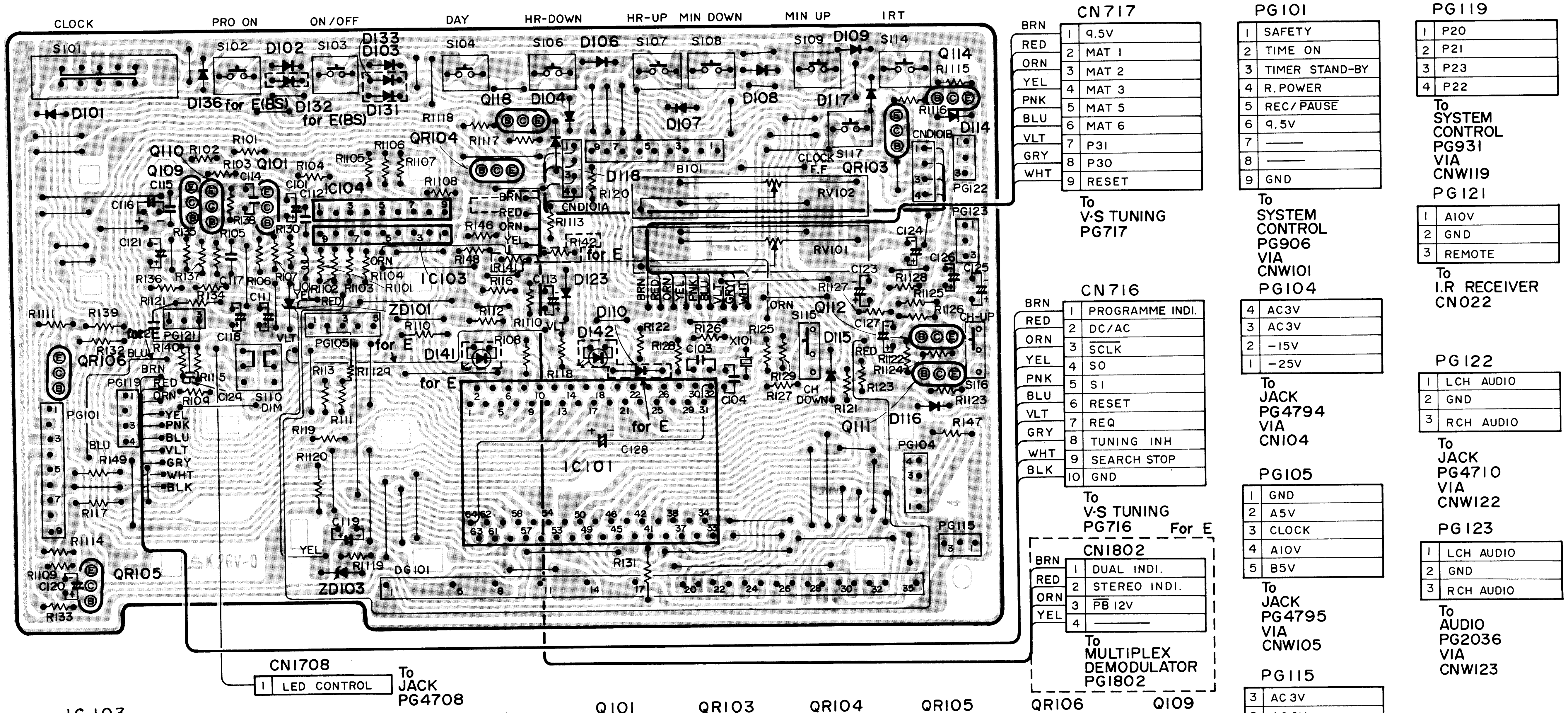
4 5 6 7 8 9 10 11 12


CLOCK
PRO ON
ON/OFF
DAY
HR-DOWN
HR-UP
MIN DOWN
MIN UP
IRT
S101
S102
D102
S103
D133
D103
S104
S106
D106
S107
S108
S109
D109
S114
Q114
R1115
D136 for E(BS)
D132 for E(BS)
D131
D101
Q118
D104
D107
D108
D117
R1116
D114
QR104
R1118
R1117
CND101B
R101
R102
R103
Q101
R104
R1105
R1106
R1107
Q110
Q109
C114
C115
C101
C112
IC104
R1108
D118
B101
CLOCK F.F
S117
QR103
PG122
C116
R138
R130
R120
BRN
RED
ORN
YEL
CND101A
RV102
RV101
PG123
C121
R135
R105
R146
R1113
R1142
for E
R136
R137
C117
R106
R107
R1102
R1103
R1104
ORN
IC103
R148
R1141
R116
C113
D123
C124
C126
C125
C123
R1128
R1127
R1125
R1126
CH-UP
R1111
R1139
R1121
C111
RED
ZD101
R112
R1110
D110
ORN
Q112
S115
D142
R122
R126
R125
C127
R132
BLU
PG121
R140
C118
VLT
PG105
R110
for E
D141
R108
R128
C103
X101
D115
RED
R1122
R1124
S116
QR106
BRN
RED
ORN
R134
R115
C129
S110 DIM
R113
R1129
for E
R118
R129
R127
CH DOWN
R1123
PG119
R109
R111
C104
R121
D116
Q111
R147
PG101
YEL
PNK
BLU
VLT
GRY
WHT
BLK
R119
R1120
for E
C128
IC101
PG104
R149
R117
C119
PG115
R1114
YEL
R1119
DG101
R131
R1109
C120
QR105
R133
ZD103
K26V-0
CN1708
To JACK PG4708
To V·S TUNING PG717
To SYSTEM CONTROL PG906 VIA CNW101
To SYSTEM CONTROL PG931 VIA CNW119
To I.R RECEIVER CN022
To V·S TUNING PG716
For E
To MULTIPLEX DEMODULATOR PG1802
To JACK PG4794 VIA CN104
To JACK PG4795 VIA CNW105
To JACK PG4710 VIA CNW122
To AUDIO PG2036 VIA CNW123
To OPERATION SWITCH/TAPE COUNTER DISPLAY PG2005 VIA CNW115

CN717

BRN	1	9.5V
RED	2	MAT 1
ORN	3	MAT 2
YEL	4	MAT 3
PNK	5	MAT 5
BLU	6	MAT 6
VLT	7	P31
GRY	8	P30
WHT	9	RESET

To V·S TUNING PG717

CN716

BRN	1	PROGRAMME INDI.
RED	2	DC/AC
ORN	3	SCLK
YEL	4	SO
PNK	5	SI
BLU	6	RESET
VLT	7	REQ
GRY	8	TUNING INH
WHT	9	SEARCH STOP
BLK	10	GND

To V·S TUNING PG716 For E

CN1802

BRN	1	DUAL INDI.
RED	2	STEREO INDI.
ORN	3	$\overline{\text{PB}}$ 12V
YEL	4	———

To MULTIPLEX DEMODULATOR PG1802

CN1708

1	LED CONTROL

To JACK PG4708

PG101

1	SAFETY
2	TIME ON
3	TIMER STAND-BY
4	R. POWER
5	REC/$\overline{\text{PAUSE}}$
6	9.5V
7	———
8	———
9	GND

To SYSTEM CONTROL PG906 VIA CNW101

PG104

4	AC3V
3	AC3V
2	−15V
1	−25V

To JACK PG4794 VIA CN104

PG105

1	GND
2	A5V
3	CLOCK
4	A10V
5	B5V

To JACK PG4795 VIA CNW105

PG115

3	AC 3V
2	AC 3V
1	−20V

To OPERATION SWITCH/TAPE COUNTER DISPLAY PG2005 VIA CNW115

PG119

1	P20
2	P21
3	P23
4	P22

To SYSTEM CONTROL PG931 VIA CNW119

PG121

1	A10V
2	GND
3	REMOTE

To I.R RECEIVER CN022

PG122

1	LCH AUDIO
2	GND
3	RCH AUDIO

To JACK PG4710 VIA CNW122

PG123

1	LCH AUDIO
2	GND
3	RCH AUDIO

To AUDIO PG2036 VIA CNW123

IC 103

1	2	3	4	5	6	7	8	9
0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2.6 (2.6)	2.6 (2.6)	2.6 (2.6)	2.6 (2.6)

IC 104

9	8	7	6	5	4	3	2	1
0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2.6 (2.6)	2.6 (2.6)	2.6 (2.6)	2.6 (2.6)

Q101

B	0.6 (0.6)
C	0 (0)
E	0 (0)

QR103

B	10.3 (10.3)
C	0 (0)
E	0 (0)

QR104

B	0 (0)
C	4.9 (4.9)
E	0 (0)

QR105

B	0 (0)
C	3.0 (3.0)
E	0 (0)

QR106

B	3.0 (3.0)
C	0 (0)
E	0 (0)

Q109

B	0 (0)
C	5.0 (5.0)
E	0 (0)

Q110

B	0.6 (0.6)
C	0 (0)
E	0 (0)

Q111

B	4.3 (4.3)
C	9.0 (9.0)
E	3.7 (3.7)

Q112

B	4.3 (4.3)
C	9.0 (9.0)
E	3.7 (3.7)

Q114

B	0 (0)
C	0 (0)
E	0 (0)

Q118

B	4.9 (4.9)
C	0 (0)
E	4.9 (4.9)

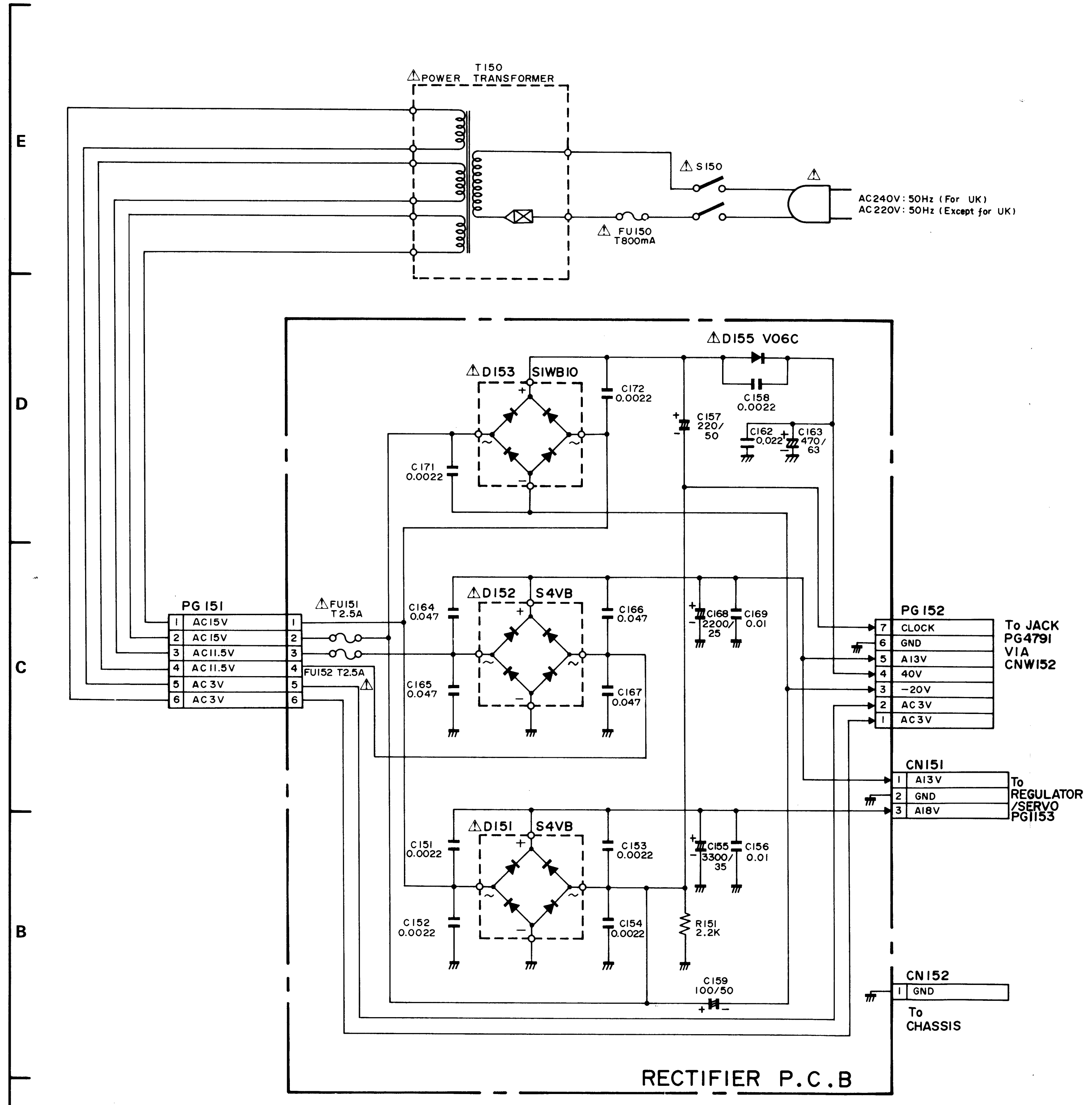
※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

IC101

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 ~ 5.1 (0 ~ 5.1)	0 (0)	1.8 (1.8)	5.2 (5.2)	0 (0)	0 (0)	5.2 (5.2)	0 (0)	0 (0)	0 (0)	3.6 (3.6)
64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
5.2 (5.2)	4.9 (4.9)	0 (0)	0 (0)	0 (0)	5.0 (5.0)	-3.5 (-3.5)	-25.0 (-25.0)	-21.0 (-21.0)	-21.0 (-21.0)	-21.2 (-21.2)	-20.9 (-20.9)	-21.0 (-21.0)	-21.0 (-21.0)	-20.9 (-20.9)	-20.8 (-20.8)

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
0 (4.5)	4.3 (4.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2.4 (2.4)	2.4 (2.4)	0 (0)
48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
0 (0)	0 (0)	-20.5 (-20.5)	-20.7 (-20.7)	0 (0)	0 (0)	0 (0)	0 (0)	-0.4 (-0.4)	1.3 (1.3)	1.3 (1.3)	-0.4 (-0.4)	-0.4 (-0.4)	0 (0)	-0.4 (-0.4)	-24.4 (-24.4)

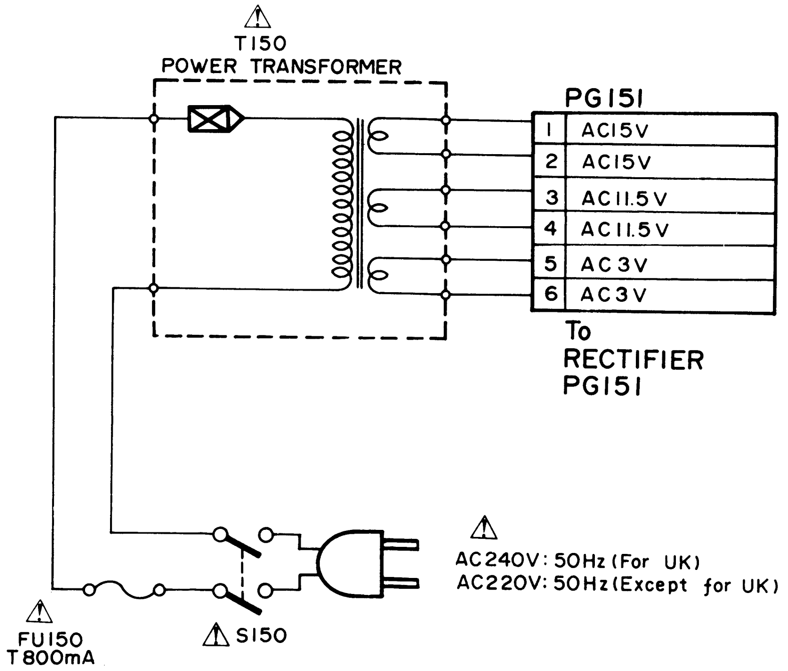
RECTIFIER

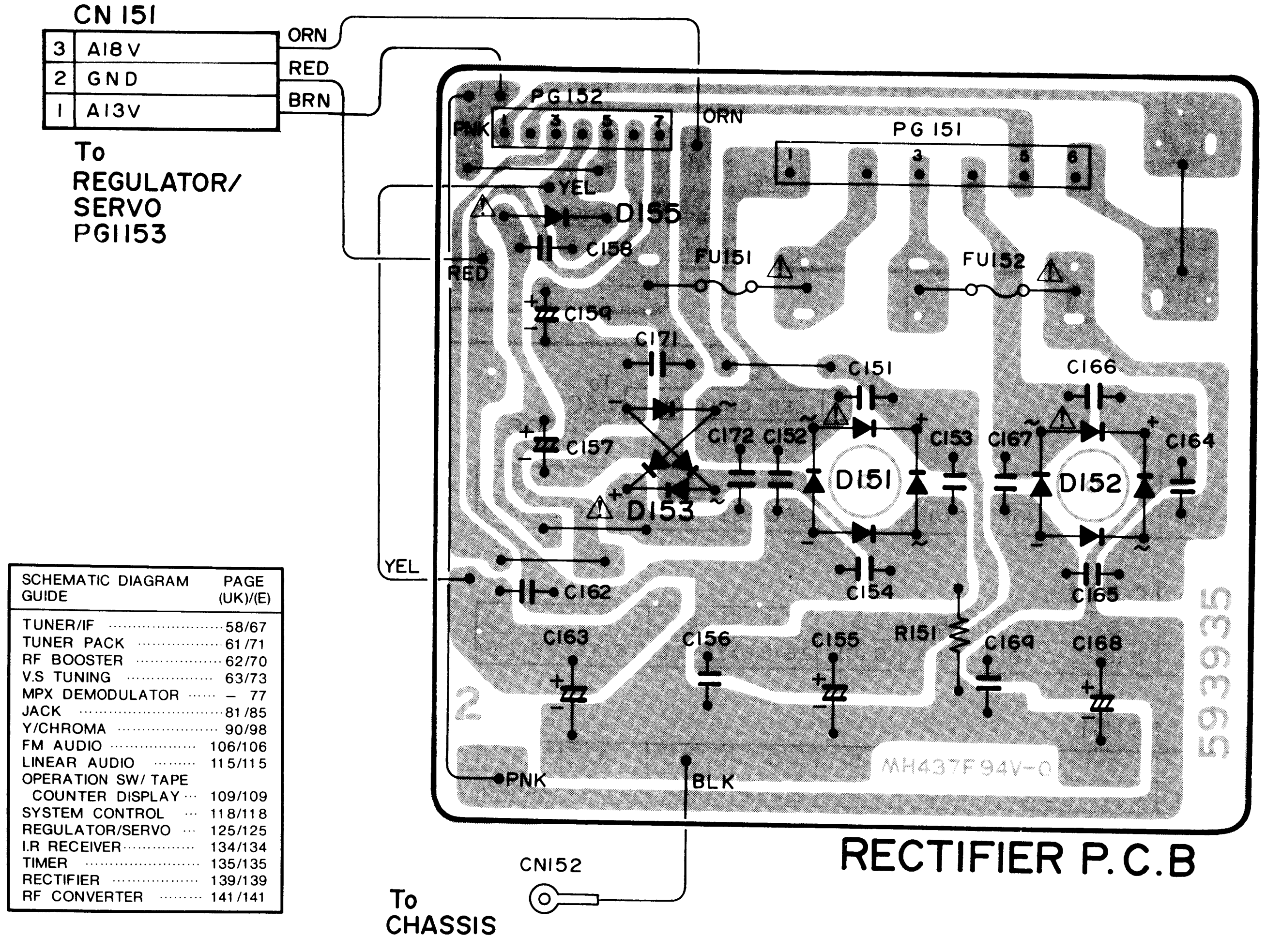

E
D
C
B
A
⚠POWER T150 TRANSFORMER
⚠S150
⚠
AC240V: 50Hz (For UK)
AC220V: 50Hz (Except for UK)
⚠FU150 T800mA
⚠D155 V06C
⚠D153 SIWB10
C172 0.0022
C158 0.0022
C157 220/50
C162 0.022
C163 470/63
C171 0.0022
⚠D152 S4VB
C164 0.047
C165 0.047
C166 0.047
C167 0.047
C168 2200/25
C169 0.01
⚠D151 S4VB
C151 0.0022
C152 0.0022
C153 0.0022
C154 0.0022
C155 3300/35
C156 0.01
R151 2.2K
C159 100/50
PG151
1 AC15V
2 AC15V
3 AC11.5V
4 AC11.5V
5 AC3V
6 AC3V
⚠FU151 T2.5A
FU152 T2.5A ⚠
PG152
7 CLOCK
6 GND
5 A13V
4 40V
3 -20V
2 AC3V
1 AC3V
To JACK PG4791 VIA CNW152
CN151
1 A13V
2 GND
3 A18V
To REGULATOR /SERVO PG1153
CN152
1 GND
To CHASSIS
RECTIFIER P.C.B

PG152

7	CLOCK
6	GND
5	A13V
4	40V
3	-20V
2	AC3V
1	AC3V

To
JACK
PG4791
VIA
CNW152


⚠
T150
POWER TRANSFORMER
PG151
1 AC15V
2 AC15V
3 AC11.5V
4 AC11.5V
5 AC3V
6 AC3V
To RECTIFIER PG151
⚠
AC240V: 50Hz (For UK)
AC220V: 50Hz (Except for UK)
⚠
FU150
T800mA
⚠S150


CN151
3 A18V
2 GND
1 A13V
ORN
RED
BRN
To REGULATOR/ SERVO PG1153
PG152
PNK
YEL
ORN
PG151
1
3
5
6
⚠
D155
C158
RED
FU151
FU152 ⚠
C159
C171
C151
C166
C157
C172
C152
⚠
C153
C167
C164
D151
D152
⚠D153
YEL
C162
C154
C165
C163
C156
C155
R151
C169
C168
2
MH437F94V-0
593935
PNK
BLK
CN152
To CHASSIS
RECTIFIER P.C.B

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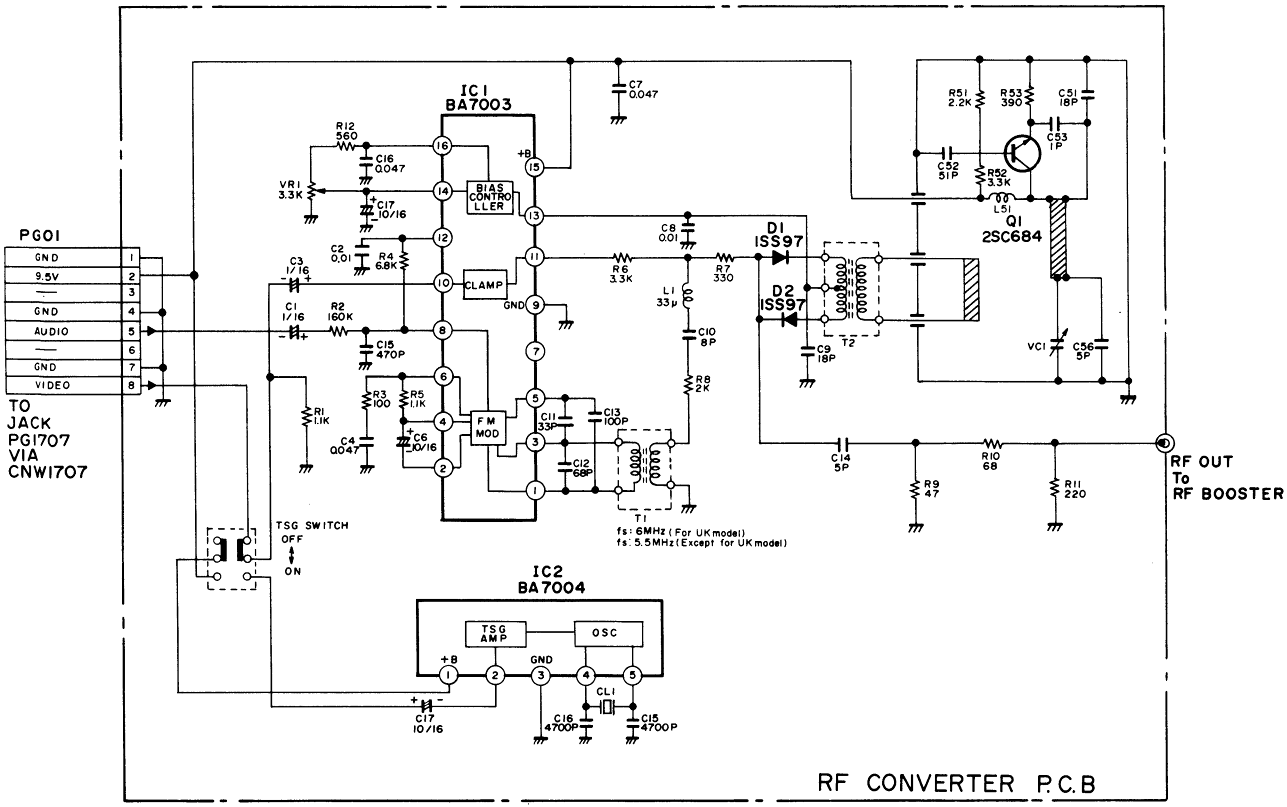
RF BOOSTER	62/70
V.S TUNING	63/73
MPX DEMODULATOR	– 77
JACK	81/85
Y/CHROMA	90/98
FM AUDIO	106/106
LINEAR AUDIO	115/115
OPERATION SW/ TAPE COUNTER DISPLAY	109/109
SYSTEM CONTROL	118/118
REGULATOR/SERVO	125/125
I.R RECEIVER	134/134
TIMER	135/135
RECTIFIER	139/139
RF CONVERTER	141/141

RF CONVERTER


PG01
GND 1
9.5V 2
— 3
GND 4
AUDIO 5
— 6
GND 7
VIDEO 8
TO JACK PG1707 VIA CNW1707
IC1 BA7003
R12 560
C16 0.047
VR1 3.3K
C17 10/16
BIAS CONTROLLER
+B
C2 0.01
R4 6.8K
C3 1/16
CLAMP
GND
C1 1/16
R2 160K
C15 470P
R3 100
R5 1.1K
R1 1.1K
C4 0.047
C6 10/16
FM MOD
C11 33P
C13 100P
C12 68P
T1
fs: 6MHz (For UK model)
fs: 5.5MHz (Except for UK model)
C7 0.047
C8 0.01
R6 3.3K
R7 330
L1 33µ
C10 8P
R8 2K
D1 ISS97
D2 ISS97
C9 18P
T2
R51 2.2K
R53 390
C51 18P
C53 1P
C52 51P
R52 3.3K
L51
Q1 2SC684
VC1
C56 5P
C14 5P
R9 47
R10 68
R11 220
RF OUT To RF BOOSTER
TSG SWITCH OFF ON
IC2 BA7004
TSG AMP
OSC
+B
GND
C17 10/16
CL1
C16 4700P
C15 4700P
RF CONVERTER P.C.B

SCHEMATIC DIAGRAM GUIDE	PAGE (UK)/(E)
TUNER/IF	58/67
TUNER PACK	61/71
RF BOOSTER	62/70
V.S TUNING	63/73
MPX DEMODULATOR	– 77
JACK	81/85
Y/CHROMA	90/98
FM AUDIO	106/106
LINEAR AUDIO	115/115
OPERATION SW/ TAPE COUNTER DISPLAY	109/109
SYSTEM CONTROL	118/118
REGULATOR/SERVO	125/125
I.R RECEIVER	134/134
TIMER	135/135
RECTIFIER	139/139
RF CONVERTER	141/141

REPLACEMENT PARTS LIST

ELECTRICAL PARTS LIST

* Parts Nos. of some of the parts destined to other area are different, so refer to the parts list of the corresponding manual for the correct parts No.

SYMBOL-NO	P-NO	DESCRIPTION
		CAPACITORS
CT201	5058414	TRIMER 20P
C141	0256154	ELECTROLYTIC 4.7UF 25V
C2030-2031	0239303	CERAMIC (RESISTOR SHAPE) 220PF+-5%
C483	0256150	ELECTROLYTIC 0.47UF 50V
C485	0256157	ELECTROLYTIC 33UF 16V
C486	0256155	ELECTROLYTIC 10UF 16V
C627	0256473	TANTALUM 4.7 16V1
C639	0256473	TANTALUM 4.7 16V1
C904	0209027	CERAMIC (RESISTOR SHAPE) 0.01MF+-30 %
C906	0209027	CERAMIC (RESISTOR SHAPE) 0.01MF+-30 %
C909	0208141	CERAMIC CAPACITOR 100PF+-5%
C910-911	0209006	CERAMIC (RESISTOR SHAPE) 470PF+-10%
C912	0209027	CERAMIC (RESISTOR SHAPE) 0.01MF+-30 %
C914	0208141	CERAMIC CAPACITOR 100PF+-5%
C915	0209006	CERAMIC (RESISTOR SHAPE) 470PF+-10%
C918	0256151	ELECTROLYTIC 1.0UF 50V
C922-931	0209027	CERAMIC (RESISTOR SHAPE) 0.01MF+-30 %
C932	0209027	CERAMIC (RESISTOR SHAPE) 0.01MF+-30 %
		RESISTORS
B101	5068311	RESISTOR BLOCK
RA2026	5378963	RESISTOR BLOCK R0704
RA601	5378953	RESISTOR BLOCK
RT1151	5007432	SEMI VARIABLE 1.0KOHM
RT4701	5007436	SEMI VARIABLE 22KOHM
RT4703	5007446	SEMI VARIABLE RESISTOR 4.7KOHM
RT4704	5007167	SEMI VARIABLE 47 KOHM
RT4705	5007437	SEMI VARIABLE 47KOHM
RT4706	5007437	SEMI VARIABLE 47KOHM
RT1891	5007445	SEMI VARIABLE 2.2KOHM (E)
RT1894	5007449	SEMI VARIABLE 47KOHM (E)
RT1895	5007451	SEMI VARIABLE 100KOHM (E)
RT1896	5007451	SEMI VARIABLE 100KOHM (E)
RT1897	5007451	SEMI VARIABLE 100KOHM (E)
RT2001	5007451	SEMI VARIABLE 100KOHM
RT2002	5007451	SEMI VARIABLE 100KOHM
RT201	5007714	SEMI VARIABLE 4.7KOHM
RT202	5007712	SEMI VARIABLE 1KOHM
RT2101	5007444	SEMI VARIABLE 1KOHM
RT2102	5007447	SEMI VARIABLE 10KOHM
RT2103	5007446	SEMI VARIABLE RESISTOR 4.7KOHM
RT2104	5007441	SEMI VARIABLE 100OHM
RT2201	5007444	SEMI VARIABLE 1KOHM

SYMBOL-NO	P-NO	DESCRIPTION
RT2202	5007447	SEMI VARIABLE 10KOHM
RT2203	5007446	SEMI VARIABLE RESISTOR 4.7KOHM
RT2204	5007441	SEMI VARIABLE 100OHM
RT401LR	5007437	SEMI VARIABLE 47KOHM
RT402LR	5007435	SEMI VARIABLE 10KOHM
RT404LR	5007438	SEMI VARIABLE 100KOHM
RT602-603	5007449	SEMI VARIABLE 47KOHM
RT604	5007446	SEMI VARIABLE RESISTOR 4.7KOHM
RT605	5007447	SEMI VARIABLE 10KOHM
RT608	5007452	SEMI VARIABLE 220KOHM
RT613-614	5007452	SEMI VARIABLE 220KOHM
RT615	5007491	SEMI VARIABLE 470KOHM
RT617	5007466	SEMI VARIABLE 220KOHM
RV401	5005592	VARIABLE RESISTOR 10KOHM
RV901	5005451	VARIABLE RESISTOR 50KOHM(B)
RV902	5005453	VARIABLE RESISTOR 10KOHM(B)
R1740-1742	0170472	FUSE RESISTOR 3.3OHM+-5% 1/4W (E)
R4800	0111153	METAL OXIDE 1KOHM 1W
R4801-4802	0111153	METAL OXIDE 1KOHM 1W
R4803	0171034	METAL OXIDE FILM RESISTOR 820 OHM+-5% 1W
R4804	0170481	FUSE RESISTOR 22OHM+-5% 1/4W
R1960	0171262	METAL FILM RESISTOR
R2009-2010	0170472	FUSE RESISTOR 3.3OHM+-5% 1/4W
R471	0170481	FUSE RESISTOR 22OHM+-5% 1/4W
R488	0149705	METAL FILM RESISTOR 470 OHM
R980	0171265	METAL FILM RESISTOR 49.3KOHM
R992	0249794	POSITIVE THERMISTOR
VR101-102	5020203	VARIABLE RESISTOR 220KOHM(B)
		SEMI-CONDUCTORS
DG2001	5311122	COUNTER
D001	5331592	DIODE 1SS133
D101-104	5331592	DIODE 1SS133
D106-109	5331592	DIODE 1SS133
D110	5331592	DIODE 1SS133 (E)
D114-115	5331592	DIODE 1SS133
D1151-1152	5331671	DIODE DS135D-FA3
D1154	5331511	DIODE DAN201
D1156-1159	5331592	DIODE 1SS133
D116-117	5331592	DIODE 1SS133
D1160-1161	5331592	DIODE 1SS133
D118	5331592	DIODE 1SS133
D123	5331592	DIODE 1SS133
D131-133	5331592	DIODE 1SS133 (BS)
D136	5331592	DIODE 1SS133

SEMI-CONDUCTORS

SYMBOL-NO	P-NO	DESCRIPTION
D141	5380691	LED SLR34UR (E)
D142	5380711	LED TLG-123A (E)
D151-152	5331521	DIODE S4VB10
D153	5331921	DIODE S1WD
D155	5330101	RECTIFIER SILICON V06C 15K
D4701	5331592	DIODE 1SS133 (E)
D4703-1704	5331592	DIODE 1SS133 (E)
D4705	5331592	DIODE 1SS133
D4706	5331592	DIODE 1SS133 (E)
D4707-4708	5331592	DIODE 1SS133
D4709-4710	5331592	DIODE 1SS133 (E)
D4712-4713	5330573	DIODE IS2473
D4714	5331592	DIODE 1SS133 (E)
D4716-4717	5331592	DIODE 1SS133 (E)
D4718-4719	5331592	DIODE 1SS133
D4785-4787	5330573	DIODE IS2473
D4789-4796	5330101	RECTIFIER SILICON V06C 15K
D1801-1804	5331592	DIODE 1SS133 (E)
D1952	5331592	DIODE 1SS133
D1953-1954	5380691	LED SLR34UR
D1981-1983	5331592	DIODE 1SS133
D2001	5331592	DIODE 1SS133
D2001	5380711	LED TLG-123A
D2002-2005	5380691	LED SLR34UR
D2004-2006	5331592	DIODE 1SS133
D2006	5380691	LED SLR34UR
D2007	5331592	DIODE 1SS133
D2008	5380711	LED TLG-123A
D2010-2011	5331592	DIODE 1SS133
D202-203	5331592	DIODE 1SS133
D2030-2031	5330134	DIODE 1S2076SZ
D2032	5331511	DIODE DAN201
D205	5331592	DIODE 1SS133
D210	5331592	DIODE 1SS133
D2101-2104	5331592	DIODE 1SS133
D211	5330131	DIODE 1S2076
D2201-2204	5331592	DIODE 1SS133
D351	5331592	DIODE 1SS133 (E)
D354	5331592	DIODE 1SS133 (E)
D405	5330712	DIODE HZ3B
D408-411	5331592	DIODE 1SS133
D413	5330324	DIODE HZ9B1
D414	5331592	DIODE 1SS133
D414	5331592	DIODE 1SS133
D481	5340205	VARISTOR VD1221
D482	5331591	DIODE 1SS133HV
D601-602	5331592	DIODE 1SS133
D604-606	5331592	DIODE 1SS133
D607	5331511	DIODE DAN201
D609	5331511	DIODE DAN201
D610-614	5331592	DIODE 1SS133
D617	5331592	DIODE 1SS133
D618	5331511	DIODE DAN201
D619-621	5331592	DIODE 1SS133
D625	5331592	DIODE 1SS133
D626	5331592	DIODE 1SS133
D628	5331592	DIODE 1SS133
D631-633	5331511	DIODE DAN201
D634	5331592	DIODE 1SS133
D636	5331511	DIODE DAN201
D638-639	5331592	DIODE 1SS133
D640	5331592	DIODE 1SS133
D643	5331592	DIODE 1SS133
D644-646	5331592	DIODE 1SS133
D691	5331592	DIODE 1SS133
D701	5330132	DIODE 1S2076A
D704-708	5331592	DIODE 1SS133
D713	5331592	DIODE 1SS133
D719	5331592	DIODE 1SS133
D721	5331592	DIODE 1SS133
D722	5331511	DIODE DAN201
D723	5331592	DIODE 1SS133
D725	5331592	DIODE 1SS133
D726	5380691	LED SLR34UR
D727-729	5380691	LED SLR34UR (E)
D732	5330131	DIODE 1S2076 (E)
D735-736	5331592	DIODE 1SS133
D901-902	5331671	DIODE DS135D-FA3
D904-905	5331511	DIODE DAN201
D906	5331592	DIODE 1SS133
D907	5331511	DIODE DAN201
D909	5331592	DIODE 1SS133
D911	5331592	DIODE 1SS133
D912	5331511	DIODE DAN201
D913-914	5331592	DIODE 1SS133
D915	5331592	DIODE 1SS133
D916-918	5331592	DIODE 1SS133
D920	5331592	DIODE 1SS133
D921-922	5331511	DIODE DAN201
D923-929	5331592	DIODE 1SS133
D931	5331592	DIODE 1SS133
D933	5331592	DIODE 1SS133

SEMI-CONDUCTORS

SYMBOL-NO	P-NO	DESCRIPTION
D934	5331592	DIODE 1SS133
D938-939	5331592	DIODE 1SS133
D945-946	5331592	DIODE 1SS133
D953	5331592	DIODE 1SS133
IC051	5355261	IC MPC1373H
IC101	5361293	IC MPD7519G-075
IC103-104	5355241	IC NJD6506S
IC1151	5369171	IC M54543L
IC1152	5369181	IC M5218L
IC1153	5355241	IC NJD6506S
IC1154	5353491	IC EXB341
IC141	5391032	HOLEIC DN6838A
IC142	5391032	HOLEIC DN6838A
IC4701	5364701	IC M51320P
IC4702	5363231	IC LA7755 (E)
IC4703	5368311	IC LA-7808
IC4704	5364603	IC M5278L-10
IC1801	5363131	IC LA7751 (E)
IC1802	5363121	IC LA7755 (E)
IC1803	5359901	IC UPD4066C (E)
IC2001	5363971	IC HA11752
IC2001	5369681	IC MSM58371RS
IC2002	5369333	HD38805A27
IC2002	5375761	IC TA4336
IC2003	5361481	IC MPD4538BC
IC2004	5364601	IC M5278L-05
IC2005	5377382	IC HT6214
IC2006	5377392	IC HT6218
IC2007	5350605	IC NJM4558SD
IC2008	5359901	IC UPD4066C
IC2009	5355781	IC NJM2903S
IC201	5358611	MODULE HT4207
IC202	5376581	IC HT-4238
IC203	5376591	IC HT-4239
IC351	5355461	IC BA7100 (E)
IC401LR	5363321	IC BA5112
IC402	5368371	IC NR8800
IC403	5361121	ICD4066SIP
IC404	5363981	IC TK15050
IC405LR	5364061	IC TA7361P
IC406	5369181	IC M5218L
IC407	5374071	IC HT4428
IC408	5374061	IC HT4427
IC481	5355451	IC HA13402
IC601	5350961	IC BA340
IC602	5355492	IC HA11747A
IC603-604	5355501	IC HA11749
IC605	5355941	IC HA11750
IC606-607	5355241	IC NJD6506S
IC701	5369876	IC MPD1511C-175
IC702	5361531	IC MSM 5258RS
IC704	5355611	IC LA7910 (E)
IC705	5361281	IC M58653P
IC706	5365672	IC MB4204
IC707-708	5359501	IC MPD4011C
IC901	5369325	IC HD38800B12
IC902	5369331	IC HD33800B32
IC904	5369252	IC BA6304A
IC906-907	5369171	IC M54543L
IC909	5355251	IC NJD6508D
IC912	5365601	IC MPD4013C
IC913	5369181	IC M5218L
IC914	5365601	IC MPD4013C
QR103-106	5323561	TRANSISTOR DTC124F
QR201	5323561	TRANSISTOR DTC124F
Q101	5321663	TRANSISTOR 2SC2021RS
Q109-112	5321663	TRANSISTOR 2SC2021RS
Q114	5321252	2SA844D
Q1151	5323331	TRANSISTOR 2SB772-Q
Q1152-1155	5323421	TRANSISTOR 2SD1276
Q1156	5321663	TRANSISTOR 2SC2021RS
Q1158	5323332	TRANSISTOR 2SD882-Q
Q118	5321252	2SA844D
Q141	5380131	PHOTO TRANSISTOR
Q142	5380131	PHOTO TRANSISTOR
Q4701	5321663	TRANSISTOR 2SC2021RS
Q4702	5321663	TRANSISTOR 2SC2021RS (E)
Q4703-4704	5321663	TRANSISTOR 2SC2021RS (BS)
Q4705	5321663	TRANSISTOR 2SC2021RS (E)
Q4706	5321663	TRANSISTOR 2SC2021RS (E)
Q4707	5321663	TRANSISTOR 2SC2021RS (E)
Q4708-4709	5321663	TRANSISTOR 2SC2021RS
Q4710	5322802	TRANSISTOR 2SA934Q
Q4711	5322732	TRANSISTOR 2SA952ML2
Q4712	5321663	TRANSISTOR 2SC2021RS
Q4713	5321252	2SA844D
Q4714-4716	5321663	TRANSISTOR 2SC2021RS
Q4718	5321663	TRANSISTOR 2SC2021RS
Q4793	5321663	TRANSISTOR 2SC2021RS
Q4794	5323323	TRANSISTOR 2SD1251-PO
Q4796	5320603	TRANSISTOR SILICON 2SA673A-C 80MHZ 400MW
Q4797	5321663	TRANSISTOR 2SC2021RS

SYMBOL-NO	P-NO	DESCRIPTION
		SEMI-CONDUCTORS
Q1801-1802	5321663	TRANSISTOR 2SC2021RS (E)
Q1803	5320593	TRANSISTOR 2SA673C (E)
Q1804-1806	5321663	TRANSISTOR 2SC2021RS (E)
Q1807	5320593	TRANSISTOR 2SA673C (E)
Q1808	5321663	TRANSISTOR 2SC2021RS (E)
Q1810	5321663	TRANSISTOR 2SC2021RS (E)
Q1812-1813	5321663	TRANSISTOR 2SC2021RS (E)
Q1814-1815	5320593	TRANSISTOR 2SA673C (E)
Q1818	5321663	TRANSISTOR 2SC2021RS (E)
Q2001	5321252	2SA844D
Q2002-2007	5321663	TRANSISTOR 2SC2021RS
Q2008	5322216	TRANSISTOR 2SC1741QR
Q2009-2010	5321663	TRANSISTOR 2SC2021RS
Q201-202	5321662	TRANSISTOR 2SC2021S
Q205-211	5321662	TRANSISTOR 2SC2021S
Q2101	5321663	TRANSISTOR 2SC2021RS
Q2102	5321252	2SA844D
Q212	5321252	2SA844D
Q213	5321662	TRANSISTOR 2SC2021S
Q214-215	5321252	2SA844D
Q217-218	5321662	TRANSISTOR 2SC2021S
Q220	5321662	TRANSISTOR 2SC2021S
Q2201	5321663	TRANSISTOR 2SC2021RS
Q2202	5321252	2SA844D
Q225-227	5321662	TRANSISTOR 2SC2021S
Q228	5321252	2SA844D
Q229	5321662	TRANSISTOR 2SC2021S
Q234-235	5321662	TRANSISTOR 2SC2021S (BS)
Q354-355	5321662	TRANSISTOR 2SC2021S (E)
Q356	5321252	2SA844D (E)
Q405	5323561	TRANSISTOR DTC124F
Q406	5323561	TRANSISTOR DTC124F
Q407-410	5321663	TRANSISTOR 2SC2021RS
Q411	5320593	TRANSISTOR 2SA673C
Q412-413	5323561	TRANSISTOR DTC124F
Q414LR	5323561	TRANSISTOR DTC124F
Q415	5323561	TRANSISTOR DTC124F
Q481	5321662	TRANSISTOR 2SC2021S
Q482	5321662	TRANSISTOR 2SC2021S
Q601	5321663	TRANSISTOR 2SC2021RS
Q603	5321663	TRANSISTOR 2SC2021RS
Q605-606	5321663	TRANSISTOR 2SC2021RS
Q613-617	5321663	TRANSISTOR 2SC2021RS
Q701	5321663	TRANSISTOR 2SC2021RS
Q702	5321252	2SA844D
Q703	5323561	TRANSISTOR DTC124F
Q705	5321663	TRANSISTOR 2SC2021RS

SYMBOL-NO	P-NO	DESCRIPTION
Q706-707	5321663	TRANSISTOR 2SC2021RS
Q708	5321252	2SA844D (BS)
Q709	5321663	TRANSISTOR 2SC2021RS
Q713	5321663	TRANSISTOR 2SC2021RS
Q714	5323561	TRANSISTOR DTC124F
Q722	5321663	TRANSISTOR 2SC2021RS
Q724	5320603	TRANSISTOR SILICON 2SA673A-C 80MHZ 400MW
Q733	5320603	TRANSISTOR SILICON 2SA673A-C 80MHZ 400MW
Q736	5321663	TRANSISTOR 2SC2021RS
Q901-903	5321663	TRANSISTOR 2SC2021RS
Q906-907	5321663	TRANSISTOR 2SC2021RS
Q909-910	5321663	TRANSISTOR 2SC2021RS
Q912	5321252	2SA844D
Q913	5321663	TRANSISTOR 2SC2021RS
Q914-918	5323561	TRANSISTOR DTC124F
ZD101	5331771	ZENNER DIODE RD4.7JB1
ZD103	5330324	DIODE HZ9B1
ZD1151	5330535	DIODE HZ-9A2
ZD1152	5331271	ZENNER DIODE HZ18
ZD1153	5330393	ZENER DIODE SILICON HZ6C 1MHZ
ZD1154	5330535	DIODE HZ-9A2
ZD1155	5330329	ZENNER DIODE HZ9C2
ZD1156	5330313	ZENNER DIODE HZ-7C
ZD1157	5330535	DIODE HZ-9A2
ZD4768	5330317	ZENNER DIODE HZ7A-1
ZD4787	5331491	ZENNER DIODE HZ22-1
ZD4788	5330541	ZENER DIODE HZ-15
ZD4789	5330541	ZENER DIODE HZ-15
ZD4791	5331014	ZENNER DIODE HZ5A
ZD2001	5330327	DIODE HZ-9B2
ZD481	5330713	DIODE HZ-3B
ZD601	5330396	ZENNER DIODE HZ-6A1
ZD721	5350611	IC UPC574J
ZD723	5331263	ZENNER DIODE HZ7-B3L
ZD901	5330325	DIODE HZ9A2
		TRANSFORMERS
T1801	5120921	COIL (E)
T1802	5120931	TRAP COIL (E)
		COILS
CP201	5162332	LOW PASS FILTER
CP202	5162334	HIGH PASS FILTER
CP203	5123833	COIL
CP204	5785411	DELAY LINE
CP205	5162345	LOW PASS FILTER

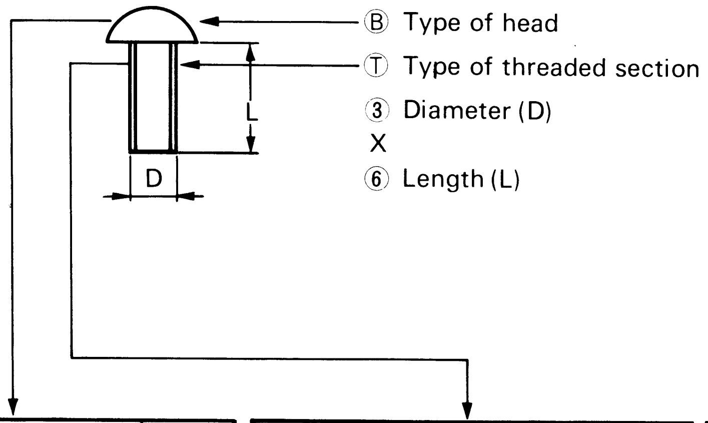
SYMBOL-NO	P-NO	DESCRIPTION
		COILS
CP206	5162344	DELAY LINE
CP207	5785221	2H DELAY LINE
CP208	5161902	BAND PASS FILTER
CP209	5162346	LOW PASS FILTER
CP210	5161974	BAND PASS FILTER
L051	5120567	TRAP COIL
L101	5152337	CHOKE COIL 100UH+-10%
L4701	5152346	CHOKE COIL 470UH+-10%
L4702-4703	5152346	CHOKE COIL 470UH+-10% (E)
L4704	5152346	CHOKE COIL 470UH+-10% (BS)
L4705	5152348	CHOKE COIL 680MH
L4706	5152334	CHOKE COIL 56UH+-10%
L4707	5152346	CHOKE COIL 470UH+-10%
L4708	5152337	CHOKE COIL 100UH+-10%
L4709-4710	5152346	CHOKE COIL 470UH+-10%
L4711	5152346	CHOKE COIL 470UH+-10%
L2001	5159029	CHOCKE COIL 150MH
L2001-2002	5152337	CHOKE COIL 100UH+-10%
L2003	5152337	CHOKE COIL 100UH+-10%
L2004	5152334	CHOKE COIL 56UH+-10%
L2006-2009	5152337	CHOKE COIL 100UH+-10%
L201	5152324	CHOKE COIL 10UH+-10%
L2011	5152337	CHOKE COIL 100UH+-10%
L202	5152342	CHOKE COIL 220UH+-10%
L203	5152332	CHOKE COIL 39UH+-10%
L204	5152336	CHOKE COIL 82UH+-10%
L205	5152337	CHOKE COIL 100UH+-10%
L206	5152346	CHOKE COIL 470UH+-10%
L207	5152337	CHOKE COIL 100UH+-10%
L208	5152334	CHOKE COIL 56UH+-10%
L209-210	5152346	CHOKE COIL 470UH+-10%
L211	5152342	CHOKE COIL 220UH+-10%
L212	5152332	CHOKE COIL 39UH+-10%
L213	5152333	CHOKE COIL 47UH+-10%
L214	5152346	CHOKE COIL 470UH+-10%
L215-216	5152342	CHOKE COIL 220UH+-10%
L217	5152349	CHOKE COIL 820MH
L218	5152337	CHOKE COIL 100UH+-10%
L219	5152342	CHOKE COIL 220UH+-10%
L220	5152324	CHOKE COIL 10UH+-10%
L221	5152332	CHOKE COIL 39UH+-10%
L224	5152342	CHOKE COIL 220UH+-10%
L226	5152336	CHOKE COIL 82UH+-10%
L231	5152331	CHOKE COIL 33UH+-10%
L232	5152333	CHOKE COIL 47UH+-10%
L352	5150577	CHOCK COIL 12MH (E)
L353	5152344	CHOKE COIL 330MICRO H (E)
L354	5152623	CHOKE COIL 15000MICRO H (E)
L355	5152329	CHOKE COIL 27 MICROH (E)
L401LR	5120922	BIAS TRAP COIL
L402LR	5152623	CHOKE COIL 15000MICRO H
L403LR	5162282	FILTER BLOCK
L404	5152349	CHOKE COIL 820MH
L405	5152336	CHOKE COIL 82UH+-10%
L901	5159027	CHOCKE COIL 100MH
		CRYSTALS
CE02030	5780634	XTAL
X101	5780991	XTAL
X201	5780534	CRYSTAL 4,435572MHZ
X701	5780651	3.58MHZ XTAL
		MISCELLANEOUS
	5602091	MAIN SWITCH
	6871851	HOLDER(HOLE IC)
	6871851	HOLDER(HOLE IC)
	6879981	JACK HOLDER
B701	5060041	CR PACK
CP401	5261071	O.S.C BLOCK
FU150	5720175	FUSE 0,8A
FU151-152	5721064	FUSE 2,5A
F2101	5162554	FILTER 1,4MHZ
F2201	5162555	FILTER 1,8MHZ
J401	5674441	JACK
PD051	5380892	PHOT, DIODE PH302
PH1151	0249795	POTHISTOR
S101	5624454	SLIDE SWITCH
S102-104	5633784	SWITCH
S106-109	5633784	SWITCH
S110	5633792	PUSH SWITCH
S114	5633784	SWITCH
S115-116	5633961	PUSH SWITCH
S117	5633784	SWITCH
S141	5633991	PUSH SWITCH
S1951	5633911	SWITCH
S1952	5633311	PUSH SWITCH
S2001-2004	5633911	SWITCH
S2005	5633911	SWITCH
S2007-2009	5633911	SWITCH
S201	5622462	SLIDE SWITCH
S2030-2031	5633911	SWITCH
S701	5622602	SWITCH
S704-407	5633784	SWITCH
S708	5633784	SWITCH (E)
S709	5633784	SWITCH
S901-902	5624442	SLIDE SWITCH
S903-904	5633311	PUSH SWITCH
S905	5624442	SLIDE SWITCH

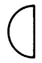
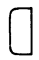
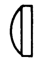
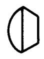
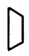
MEMO

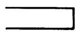
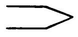
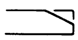
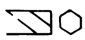
EXPLODED VIEWS

SCREW CLASSIFICATION

Example: BT3 × 6



Abbre-viation	Name	Shape
No symbol	Brazier head	
P	Pan head	
B	Binding head	
O	Oval countersunk head	
F	Flat countersunk head	

Abbre-viation	Name	Shape
No symbol	Machine (clamps without tapping)	
t	Tapping (clamps with tapping) Type 1	
T	Tapping (clamps with tapping) Type 2	
f	Forming tight (for metal)	
Note	Since the forming tight screw tightens while self-tapping. machine screws can be replaced by tapping screws.	

Washers and Nuts

Abbre-viation	Name	Shape
W	Washer	
LW	Spring washer	
LW	Locking washer	
E	E-ring	
N	Nut	
Note	Internal dia is indicated for nuts and washers.	

LUBRICATION

Lubrication points are shown in the exploded view diagrams by marks

Lubricants shown in the diagram are as follows.

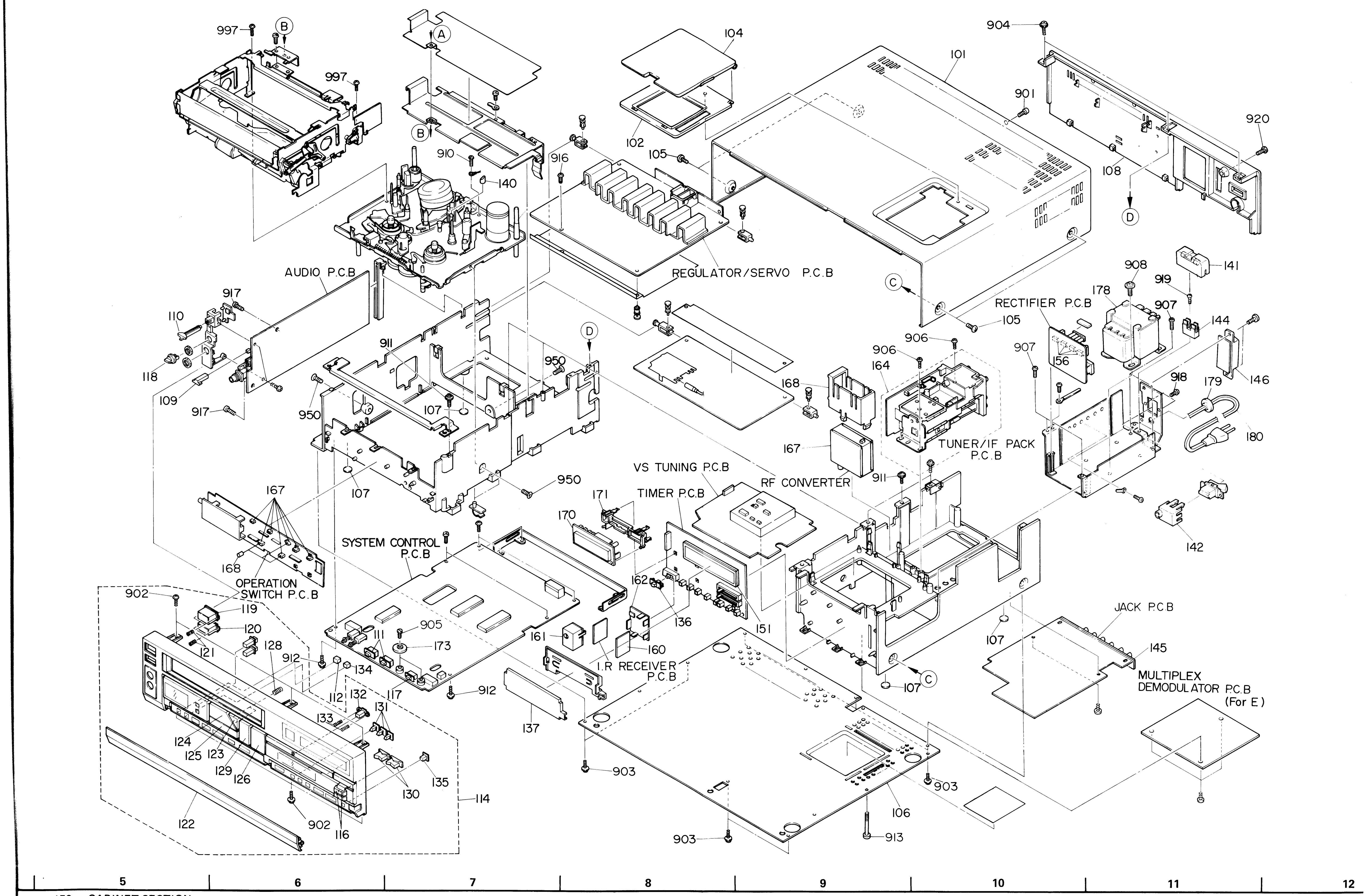
Ⓟ Pan motor oil (× 10W-40)
Ⓢ Sonic slider oil (# 1600)
(Si) Silicone grese (KS-64)
Ⓗ Hitazol (MO-138)
No symbol Froil (GB-TS-)

REPLACEMENT PARTS LIST

MECHANICAL PARTS LIST

SYMBOL-NO	P-NO	DESCRIPTION
		FOR FINAL ASSEMBLY
101	6049218	TOP CASE
102	6876473	DOOR GUIDE
104	6875587	CHANNEL PRESET DOOR
105	7783072	SCREW
106	7388361	BOTTOM COVER ASSEMBLY
107	7740662	FELT-LEG
108	6020325	REAR CASE (BS)
108	6020327	REAR CASE (E)
109	6058211	BUTTON HOLDER
110	6879961	BUTTON HOLDER
111	6058221	KNOB
112	6058242	PUSH BUTTON
113	6058843	BUTTON(MODE)
114	6236121	FRONT PANEL ASSEMBLY (BS)
114	6236123	FRONT PANEL ASSEMBLY (E)
114	6236127	FRONT PANEL ASSEMBLY (E)
116	6075372	SLIDE KNOB
117	6058991	KNOB
118	6075611	VOLUME KNOB
119	6058597	BUTTON (POWER)
120	6058607	BUTTON (TIMER)
121	6520992	SPRING
122	6174906	JACK DOOR
123	6065151	BUTTON (RECORDING) (E)
123	6065153	BUTTON (RECORDING) (BS)
124	6065033	BUTTON (PLAY)
125	6065043	BUTTON (F,F/REW)
126	6065023	BUTTON (STOP/PAUSE)
127	6068401	BUTTON (CHANNEL SELECT)
128	6304201	SPRING
129	6059033	BUTTON (PAUSE/FADV.)
130	6058763	BUTTON(HOUR/MINUTE)
131	6058711	BUTTON (PROG./ON.OFF/DAY)
132	6068651	BUTTON (DIMMER)
133	6303714	SPRING
134	6069391	BUTTON (MEMORY)
135	6068411	BUTTON (IRT)
136	6066741	BUTTON (NOR./SELECT)
137	6235631	CHP PANEL ASSEMBLY (E)
137	6235632	CHANNEL PRESET PANEL ASSMBLY (BS)
140	6864241	CAP
141	6746881	FUSE COVER
142	6773211	SWITCH COVER
144	5722131	1P FUSE HOLDER
145	5672624	JACK PLATE
146	5653411	21 P CONNECTOR (E)
151	5311131	TIMER DISPLAY
156	5722214	FUSE HOLDER
160	7758592	INSULATION SHEAT
161	6871091	IR RECEIVER CAP
162	6864951	I.R RECEIVER COVER
164	5585896	VTR FRONT END (BS)
164	5586061	VTR FRONTEND
164	5586113	VTR FRONTEND (E)
167	5585702	RF CONVERTER (E)
167	5587111	RF CONVERTER (BS)
168	6871043	RF HOLDER
170	5381701	LEVEL MATER
171	6881711	HOLDER (LEVEL METER)
173	6075081	KNOB
178	5213358	POWER TRANSFORMER (E)
178	5213359	POWER TRANSFORMER (BS)
179	6794591	BUSHING
180	5746157	POWER CORD (E)
180	5746342	POWER CORD (BS)

CABINET SECTION


997
B
A
997
B
910
140
104
102
105
916
101
901
904
920
108
D
REGULATOR/SERVO P.C.B
C
105
908
919
141
178
RECTIFIER P.C.B
907
144
907
156
146
918
179
180
AUDIO P.C.B
917
110
118
109
917
911
950
D
950
107
107
950
906
906
164
168
167
RF CONVERTER
911
TUNER/IF PACK
P.C.B
142
VS TUNING P.C.B
171
TIMER P.C.B
170
167
168
OPERATION
SWITCH P.C.B
SYSTEM CONTROL
P.C.B
162
136
151
107
107
C
JACK P.C.B
145
MULTIPLEX
DEMODULATOR P.C.B
(For E)
902
119
120
121
128
111
905
173
161
160
I.R RECEIVER
P.C.B
912
134
112
132
117
912
131
133
137
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125
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913
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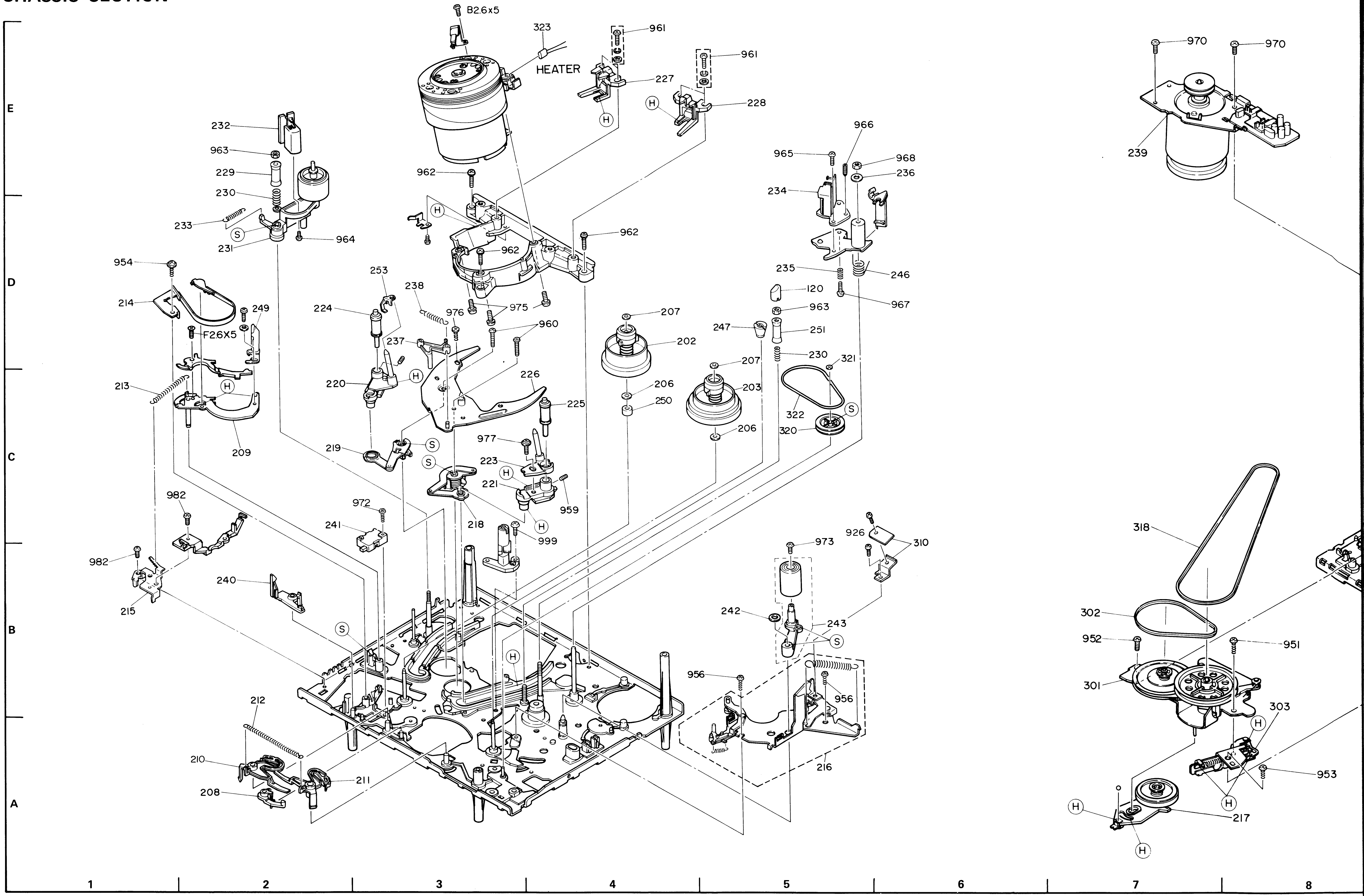
CHASSIS SECTION


B2.6x5
323
HEATER
961
227
961
228
H
970
970
239
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963
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S
231
964
962
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962
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968
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234
235
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120
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963
954
214
249
F2.6X5
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224
238
976
975
960
237
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202
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318
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956
301
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D
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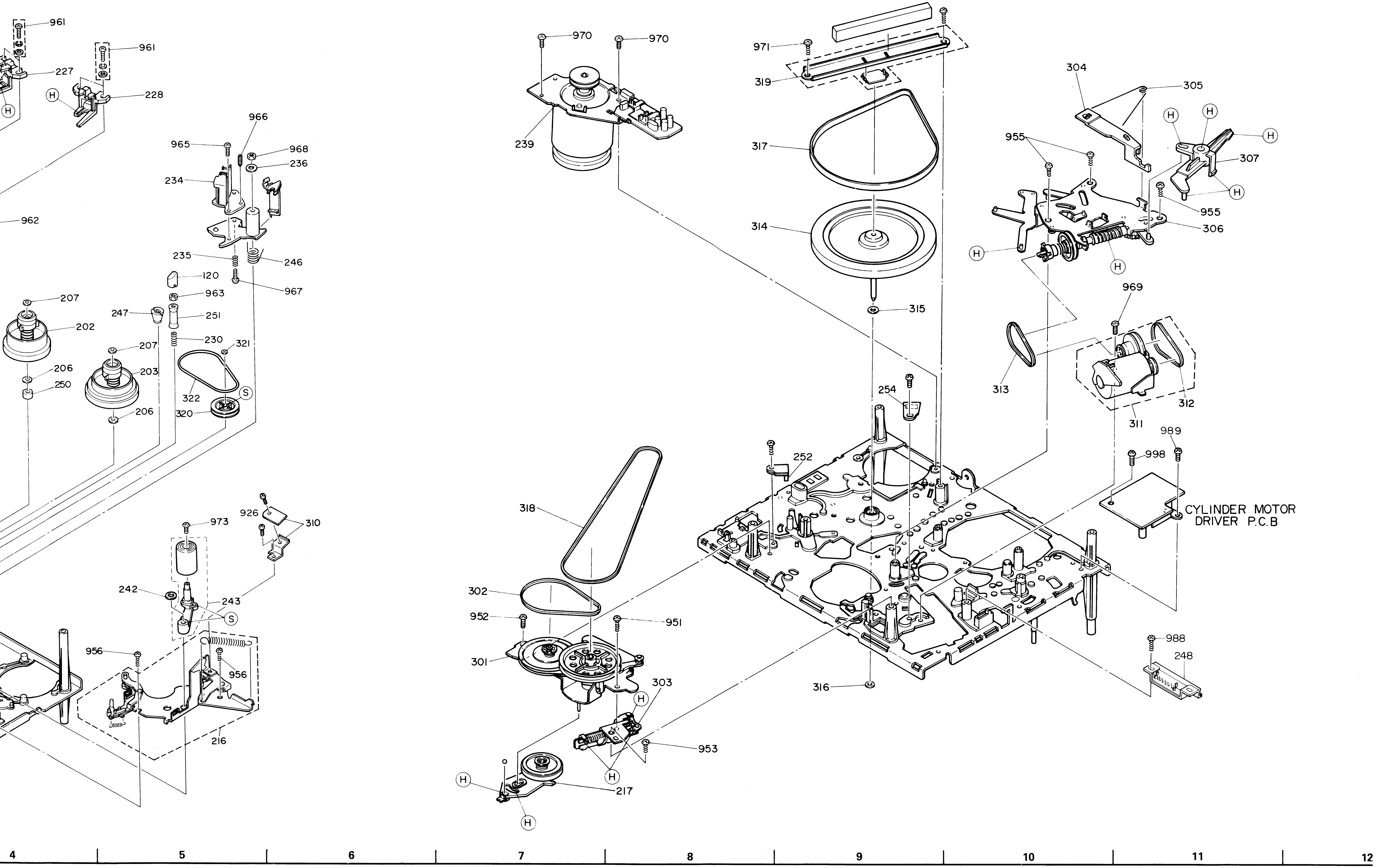
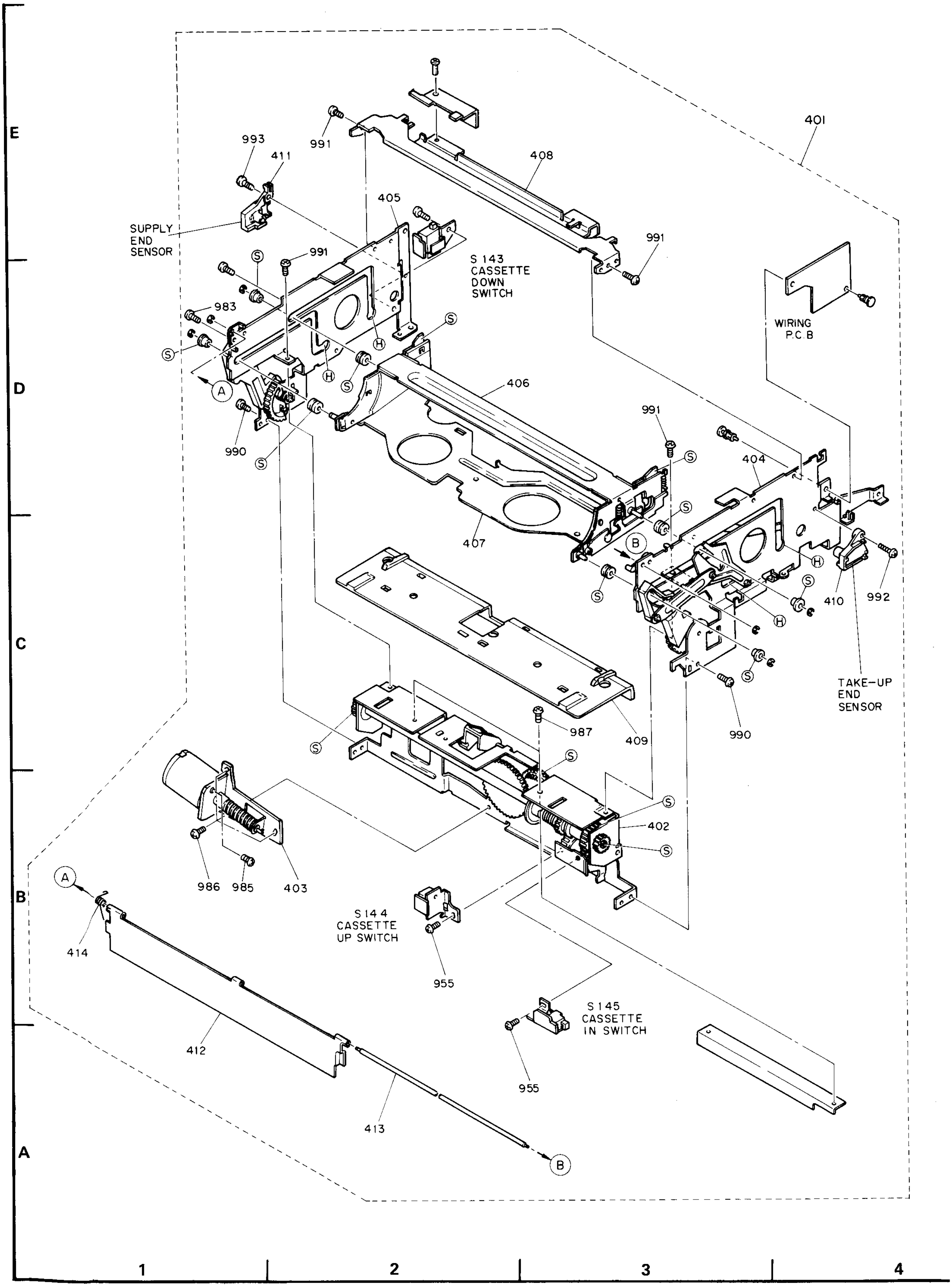
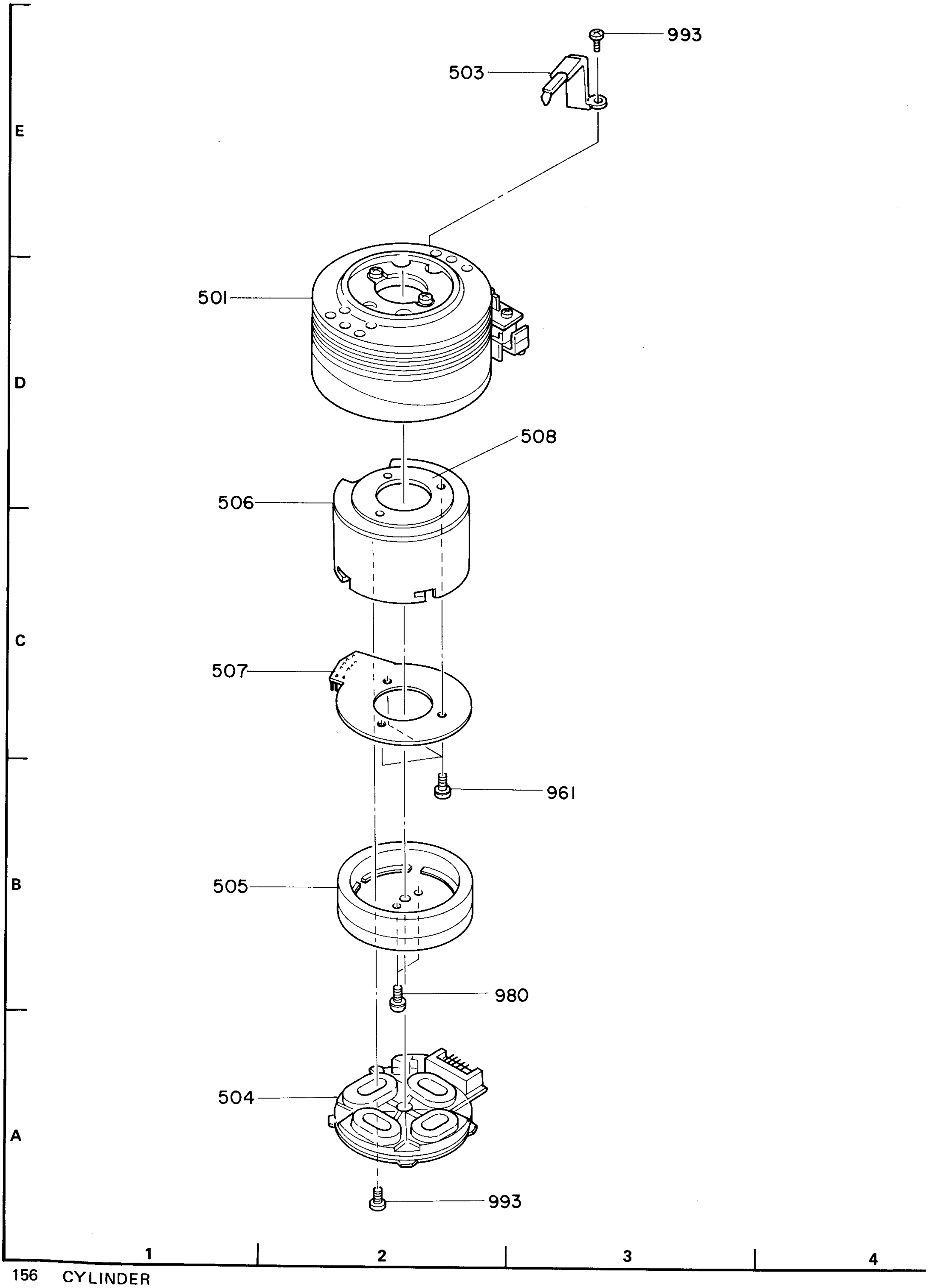

H
S
H
CYLINDER MOTOR
DRIVER P.C.B
S

CASSETTE LOADING MECHANISM SECTION


E
D
C
B
A
1
2
3
4
401
993
991
411
408
405
SUPPLY END SENSOR
991
S 143 CASSETTE DOWN SWITCH
991
983
S
H
WIRING P.C.B
A
406
990
991
404
407
B
410
992
TAKE-UP END SENSOR
409
987
990
402
986
985
403
S 144 CASSETTE UP SWITCH
414
955
S 145 CASSETTE IN SWITCH
412
955
413
B

CYLINDER


993
503
E
501
D
508
506
C
507
961
B
505
980
504
A
993
1
2
3
4

SYMBOL-NO	P-NO	DESCRIPTION
		FOR FINAL ASSEMBLY
202	6414653	SPPLY REEL TABLE ASSEMBLY
203	6414674	TAKE-UP REEL ASSEMBLY
206	7787412	WASHER
207	7778859	POLYSLIDER WASHER
208	6865662	BRAKE ARM
209	7379573	TENSION ARM ASSEMBLY
210	6865804	BRAKE L
211	6865812	BRAKE R
212	6302471	SPRING
213	6543863	SPRING
214	7376271	TENSION BAND
215	7386851	SPRING HOLDER
216	7382673	ARM BRAKET ASSEMBLY
217	6875372	FR ARM ASSEMBLY
218	7376303	LOADING LINK R ASSEMBLY
219	7376313	LOADING LINK L ASSEMBLY
220	6978301	GUIDE ROLLER BASE (I)
221	6977588	GUIDE ROLLER BASE
223	6977491	INCLINED GUIDE (TAKE-UP)
224	6344621	GUIDE ROLLER
225	6344621	GUIDE ROLLER
226	7376176	GUIDE BASE HOLDER
227	6977561	CATCHER (SUPPLY)
228	6977571	CATCHER (TAKE-UP)
229	7570671	TAPE GUIDE (I)
230	6304903	SPRING
231	6873332	IMPEDANCE ARM ASSEMBLY
232	5447841	F E HEAD
233	6302391	SPRING
234	5447801	AUDIO CONTROL HEAD
235	6304906	SPRING
236	7786245	WASHER
237	6878931	S SUB BRAKE
238	6300084	SPRING
239	5578012	CAPSTAN MOTOR
240	6865675	RECORDING PREVENTION ARM
241	5633971	SWITCH (S141)
242	7788143	POLYSLIDER WASHER
243	6977811	PRESSURE ROLLER ARM ASSEMBLY
246	6547811	SPRING
247	7549271	X-ADJUST SCREW
248	5625091	SLIDE SWITCH
249	5448992	CUE HEAD
250	6873291	COLOR
251	7570671	TAPE GUIDE (I)
252	7092145	TAKE UP REEL SENSOR ASSEMBLY
253	6877521	COLLAR
254	7092146	SUPPLY REEL SENSOR ASSEMBLY
301	7395303	CLATCH PLATE ASSEMBLY
302	6355561	BELT
303	7379666	BLAKE SLIDER
304	6865733	MODE SLIDER
305	6547821	SPRING
306	6866297	LOADING GEAR ASSEMBLY
307	6865791	TENTION ARM
310	5372661	DEW SENSOR
311	7376353	LOADING MOTOR ASSEMBLY
312	6355601	BELT
313	6355591	BELT
314	6977431	FLYWHEEL
315	7788142	POLYSLIDER WASHER (THRUST)
316	7788861	WASHER
317	6357531	BELT
318	6355581	BELT
319	7376323	FLYWHEEL HOLDER
320	6869291	PULLEY
321	7778859	POLYSLIDER WASHER
322	6355561	BELT
323	0249797	HEATER
401	7395782	FRONT LORDING MECHA.ASSEMBLY
402	7395227	FRONT CHASSIS ASSEMBLY
403	7382243	FL MOTOR ASSEMBLY
404	7395233	SIDE CHASSIS ASSEMBLY
405	7395242	SIDE CHASSIS
406	7381933	CASSETTE HOLDER ASSEMBLY
407	7380811	CASSETTE FLOOR
408	7382721	CHASSIS ROOF
409	6870992	GUIDE
410	6870831	HOLDER
411	6870821	HOLDER
412	7387441	CASSETTE DOOR
413	7557231	SHAFT
414	6548871	DOOR SPRING
501	5459161	H.F.4P CYLINDER ASSEMBLY
503	5792131	BRUSH
504	5792091	STATOR
505	5772601	ROTOR ASSEMBLY
506	6045531	CASE
507	5994731	CYL.FG PC BOARD
508	6590691	SPECER
901	7781138	SCREW(3X10BT)
902	7781149	TAPPING SCREW-3MMDX35MM
903	8699412	BIND TAPPING SCREW-3MMDX12MM(BLACK)
904	8699408	BT BIND HEAD SCREW-3MMDX8MM (BLACK)
905	7781138	SCREW(3X10BT)

FOR FINAL ASSEMBLY

SYMBOL-NO	P-NO	DESCRIPTION
906	8699408	BT BIND HEAD SCREW-3MMDX8MM (BLACK)
907	7781135	BT SCREW-3MMD
912	8699410	BT BIND HEAD SCREW-3MMDX10MM (BLACK)
913	8661406	SCREW(3X6PW)
914	7781134	BINDING SCREW
916	8691408	BIND TAPPING SCREW-3MMDX8MM (BLACK)
917	8691408	BIND TAPPING SCREW-3MMDX8MM (BLACK)
919	7781138	SCREW(3X10BT)
920	8671406	DT SCREW-3MMDX6MM
921	7781138	SCREW(3X10BT)
922	8660606	4X6 PW SCREW
923	8671406	DT SCREW-3MMDX6MM
925	8671406	DT SCREW-3MMDX6MM
926	8699408	BT BIND HEAD SCREW-3MMDX8MM (BLACK)
926	8741406	BIND SCREW - 3MMD X 6MM
927	7781138	SCREW(3X10BT)
950	7541392	SCREW
951	8691408	BIND TAPPING SCREW-3MMDX8MM (BLACK)
952	8741408	SCREW (B3X8)
953	8691408	BIND TAPPING SCREW-3MMDX8MM (BLACK)
954	7781133	BT SCREW-3MMD
955	8691408	BIND TAPPING SCREW-3MMDX8MM (BLACK)
956	8691408	BIND TAPPING SCREW-3MMDX8MM (BLACK)
959	7773083	SCREW
959	7773083	SCREW
960	8741408	SCREW (B3X8)
961	7782761	SCREW(B3X8 WITH S.WASHER)
962	8650412	SCREW 3X12 WITH SPRING WASHER
963	8821114	3D NUT
964	8741103	SCREW(2X3B)
965	7781872	SCREW-3MMDX8MM
966	7773086	SCREW
967	8741414	BINDING SCREW - 3MMD X 14MM
968	8821114	3D NUT
969	8741408	SCREW (B3X8)
970	8691408	BIND TAPPING SCREW-3MMDX8MM (BLACK)
971	8691408	BIND TAPPING SCREW-3MMDX8MM (BLACK)
972	8691312	BT BIND SCREW-2.6MMDX12MM
973	0741304	BIND SCREW-2.6MMDX4MM
975	8650408	SCREW
976	7782781	SCREW 3X8BT
977	8651408	SCREW WITH WASHER
978	8660306	SCREW (2.6X6PW)
980	0721305	FLAT SCREW 2.6MMD X 5MM
981	0711303	PAN HEAD SCREW - 2.6MMD X 3MM
982	8811113	WASHER - 2.6MMD 2 REQ'D
983	0741304	BIND SCREW-2.6MMDX4MM
984	0741304	BIND SCREW-2.6MMDX4MM
985	8741404	BIND SCREW-3MMDX4MM
986	0741304	BIND SCREW-2.6MMDX4MM
987	0744304	SCREW-2.6MMDX4MM
987	0744304	SCREW-2.6MMDX4MM
988	8691410	BT BIND SCREW-3MMDX10MM
989	8691408	BIND TAPPING SCREW-3MMDX8MM (BLACK)
990	0741304	BIND SCREW-2.6MMDX4MM
991	0741304	BIND SCREW-2.6MMDX4MM
992	0741308	BIND SCREW-2.6MMDX8MM
993	0741305	SCREW(2.6X5B)
994	8741108	BINDSREW-2MMDX8MM
995	0741304	BIND SCREW-2.6MMDX4MM
996	8741404	BIND SCREW-3MMDX4MM
997	8741408	SCREW (B3X8)
998	8741408	SCREW (B3X8)
999	8741406	BIND SCREW - 3MMD X 6MM

FOR ACCESSARIES

SYMBOL-NO	P-NO	DESCRIPTION
219	5638071	WIRELESS REMOTE CONTROL BOX
220	5746623	CABLE (BS)
221	5747741	CONNECTOR CORD
222	5898876	CONNECTOR CORD (E)
223	7063971	OPERATING GUIDE (BS)

HITACHI
SERVICE MANUAL

TK

No. 2129E

VT-88E

Technical Information

——VHS Hi-Fi System——

The VT-88E is a VHS Hi-Fi video deck with the following function mounted on models VT-18E and VT-19E.

- VHS Hi-Fi system using two rotary heads exclusively for audio recording/placyback.

The item shown above is described in this information.

VHS
THIS VIDEO DECK IS A VHS TYPE VIDEO RECORDER.
FOR PROPER OPERATION, ONLY THE VHS TYPE CASSETTE MUST BE USED.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

June 1984 **TOKAI WORKS**

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VHS Hi-Fi SYSTEM

OUTLINE

For a conventional VTR with a fixed audio head, tone quality depends on the tape speed, so no improvement can be expected. To improve tone quality, in the VHS system, the VHS Hi-Fi standard is provided in the home VTRs to give a performance better than a 2-track 38cm reel-to-reel audio deck. Sharp improvement of the tone quality can be achieved according to this standard without degrading the picture quality.

In the VHS Hi-Fi standard, the audio heads are installed on the rotary cylinder the same as the video heads to record the audio signal by helical scanning. This greatly increases the relative speed of the tape and head as for the audio signal processing as well as the video signal processing, and so sharp improvement of tone quality can be expected compared with the fixed head system. In this recording system with helical scanning heads, the audio signal is FM converted with different frequencies for the left and right channels (L channel audio carrier frequency: approx. 1.4 MHz, R channel carrier frequency: approx. 1.8 MHz), and then mixed and multi-layer recorded together with the video signal. With this multi-layer recording, the audio signal is recorded on the tape at a depth*1 deeper than the video signal recording by the video heads (called "deep layer" recording), and the video signal is recorded on the surface of the same track*2 immediately after the audio signal is recorded (called surface recording).

*-1. Deep layer recording: When recording the signal on the tape using the audio heads or video heads, the magnetic field is changed by varying the head gap and the current, so the depth of recording in the direction of the tape's thickness can be changed by this. Double layer recording is possible by scanning with heads with a wider gap first and then scanning with the heads with a narrower gap when the video heads and audio heads record/scan the same track.

*-2. Same track: The audio and video of the same channel are multi-layer recorded in the EP mode, but in the SP mode, the audio and video of different channels are multi-layer recorded. In the LP mode, it is intermediate between the SP and EP modes; the audio and video differ by $\pi/2$.

A compression/expansion (compander) type noise reduction system is used in this unit in place of the Dolby B-type noise reduction system used in the conventional VTRs to sharply improve the S/N.

VHS Hi-Fi SYSTEM

The VHS Hi-Fi audio recording/playback system is as follows based on the VHS standard.

Recording system . . . . . Rotary 2-head helical scan FM
Audio signal system . . . . 2- frequency FM recording
L channel audio = 1.4MHz ± 10kHz
R channel audio = 1.8MHz ± 10kHz
Scanning system . . . In the SP mode, the B-channel video head records the video signal over the track on which the A-channel audio head records the audio signal.
Track pitch: SP = 49μm
Head azimuth: ±30°
The head switching point is mechanically 120° delayed compared with the video head of the same channel and the overlap amount is more than ± 3H based on the switching point.

Record signal system

	L	R
Carrier frequency	1.4MHz ± 10kHz	1.8MHz ± 10kHz

COMPARISON OF PERFORMANCE WITH Hi-Fi AUDIO EQUIPMENT AND CONVENTIONAL VTR

Table 1 Comparison of Performance

Performance	Hi-Fi VTR	Reel-to-reel deck (2-track, 38cm)	Conventional VTR
Audio recording system	FM	Analog	Analog
Audio recording possibility	Possible	Possible	Possible
Dynamic range	80dB or more	78dB (without NR)	60dB
Frequency response	20Hz ~ 20kHz	30Hz ~ 30kHz	100Hz ~ 10kHz
Wow and flutter	less than 0.005%	0.02%	0.2%
Distortion	less than 0.5%	0.5%	1%
Maximum recording time	480 minutes in ATR mode. 240 minutes in VTR (SP) mode.	90 minutes	240 minutes in SP mode. 480 minutes in LP mode.

	L	R
Operation frequency deviation	±50kHz	±50kHz
Maximum frequency deviation	±150kHz	±150kHz
Record Voltage	55 mVp-p	135 mVp-p
Azimuth (viewed from magnetic surface)	+30°	–30°

CYLINDER HEAD COMPOSITION

The cylinder is provided with 2 video recording/playback heads and 2 audio recording/playback heads.
Fig. 1-A shows the head composition.

One pair of heads with 65μm width are provided as video heads. One pair of heads at 120° to the CH-1 and CH-2 video heads are provided as audio heads. These 2 heads have 36μm width and 30° azimuth and are located as shown in the figure. Deep layer recording is performed by the audio heads and then surface recording is performed with the reverse azimuth by the video heads in the FM audio system, so, the CH-1 audio head has an azimuth of 30° and is installed mechanically 60° advanced in phase when compared with the CH-2 video head. The audio

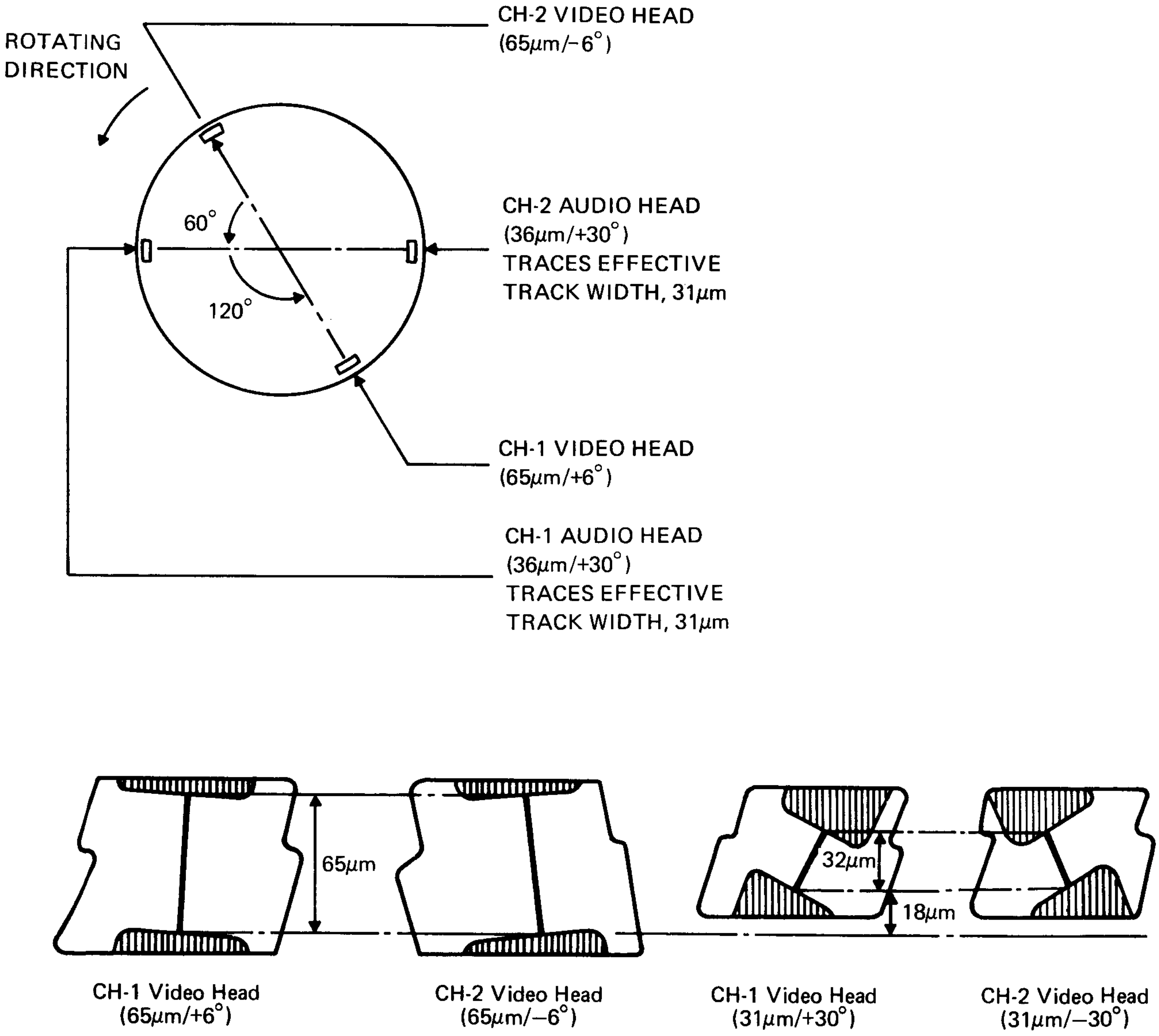

ROTATING DIRECTION
CH-2 VIDEO HEAD (65μm/-6°)
60°
120°
CH-2 AUDIO HEAD (36μm/+30°) TRACES EFFECTIVE TRACK WIDTH, 31μm
CH-1 VIDEO HEAD (65μm/+6°)
CH-1 AUDIO HEAD (36μm/+30°) TRACES EFFECTIVE TRACK WIDTH, 31μm
65μm
32μm
18μm
CH-1 Video Head (65μm/+6°)
CH-2 Video Head (65μm/–6°)
CH-1 Video Head (31μm/+30°)
CH-2 Video Head (31μm/–30°)

Fig. 1-A Cylinder Head Composition

heads are at 120° to the video heads, but the CH-1 audio track and CH-2 video track are overlapped in the SP mode, so the video heads and audio heads of different channels require a level difference of 16μm which is one-third of the SP unit tape transport amount (47μm). As the phase of the audio heads is delayed, the bottom of the audio heads is 18μm higher than that of the video heads so that double layer recording is enabled.

Recording Pattern

In the VHS Hi-Fi recording, the video signal is surface recorded over the audio signal previously deep recorded. To do this overlap recording using a cylinder with the audio heads mechanically delayed in phase compared to the video heads and at 120°, the level difference between the same channel heads, the CH-1 audio head and CH-1 video head, is 18μm measured at their bottoms and this is approx. one-third the track pitch in SP recording. As for the track width, since the audio heads have the azimuth of 30°, it is 36 x COS30° = 31μm compared to the head width 36μm. The audio track pattern is assumed to be 31μm in the following description.

Fig. 1-B shows the process of forming the SP recorded pattern. In SP recording, the tape pattern resulting from the CH-2 audio head and the pattern from the CH-1 video head overlap as shown in E). This pattern occurs as follows.

A) . . . The pattern tracked by the CH-2 audio head is a 31μm width pattern with a guardband of 34μm and azimuth of −30°.

B) . . . The pattern tracked by the CH-1 video head becomes a 49μm width pattern with an azimuth of +6°.
When the CH-2 audio head starts tracing and passes a field, the CH-1 video head reaches the tracing start point of the CH-2 audio head.

E) . . . The level difference between the CH-2 audio head and CH-1 video head is 18μm, so when the CH-2 audio head moves by one-third a field after the cylinder starts, the left edge of the CH-2 audio head matches the left edge of the CH-1 video head. That is, the CH-1 video head tracks over the pattern recorded by the CH-2 audio head.

The same applies to recording by the CH-1 audio head and CH-2 video head. The difference concerns azimuth; it is +30° with the CH-1 audio head, and −6° with the CH-2 video head, so the pattern shown in E) is caused by the process shown in C) and D).

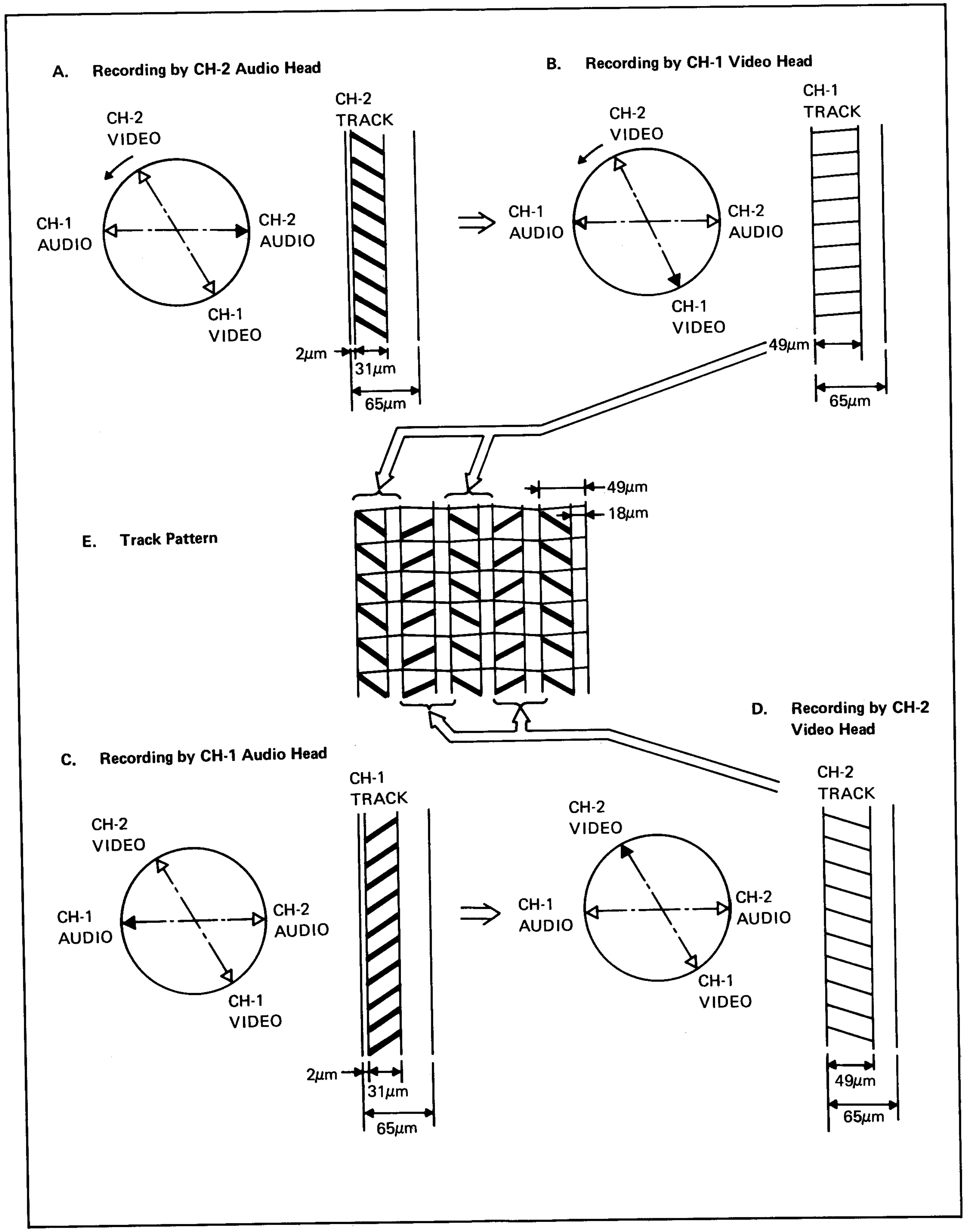

A. Recording by CH-2 Audio Head
CH-2 VIDEO
CH-1 AUDIO
CH-2 AUDIO
CH-1 VIDEO
CH-2 TRACK
2μm
31μm
65μm
B. Recording by CH-1 Video Head
CH-2 VIDEO
CH-1 AUDIO
CH-2 AUDIO
CH-1 VIDEO
CH-1 TRACK
49μm
65μm
E. Track Pattern
49μm
18μm
C. Recording by CH-1 Audio Head
CH-2 VIDEO
CH-1 AUDIO
CH-2 AUDIO
CH-1 VIDEO
CH-1 TRACK
2μm
31μm
65μm
D. Recording by CH-2 Video Head
CH-2 VIDEO
CH-1 AUDIO
CH-2 AUDIO
CH-1 VIDEO
CH-2 TRACK
49μm
65μm

Fig. 1-B Recording Pattern

FM AUDIO HEAD SWITCHING PULSE GENERATION

There is phase difference of 120° in the installation angles of the FM audio heads and the video heads. This causes the head switching points also to differ. The switching pulse of the FM audio heads is obtained by shifting the SW25Hz pulse by this phase difference. The FM audio head switching pulse is obtained from the SW25Hz pulse in IC2003 of the FM audio circuit on the audio board in this system.

Fig. 2 shows the FM audio head switching pulse generation circuit.

This circuit is composed of the 2-stage monostable multivibrators and the trailing edge of the CH-1 pulse can be adjusted by RT2002 and the leading edge of the CH-2 pulse by RT2001.

IC2003 incorporates 2 flip-flops; by providing a time constant circuit at pins 1 and 2, the pulse width of the initial stage circuit can be regulated and by providing a time constant circuit at pins 14 and 15, the pulse width in the latter stage circuit can be regulated. The respective inputs are; pins 4 and 5 for the initial stage and pins 11 and 12 for the latter stage. The truth table of this element is as shown in the figure.

As can be seen from this, it can be used as a monostable multivibrator by fixing pin A to Lo and applying a pulse to pin B, or fixing pin B to Lo and applying a pulse to pin A.

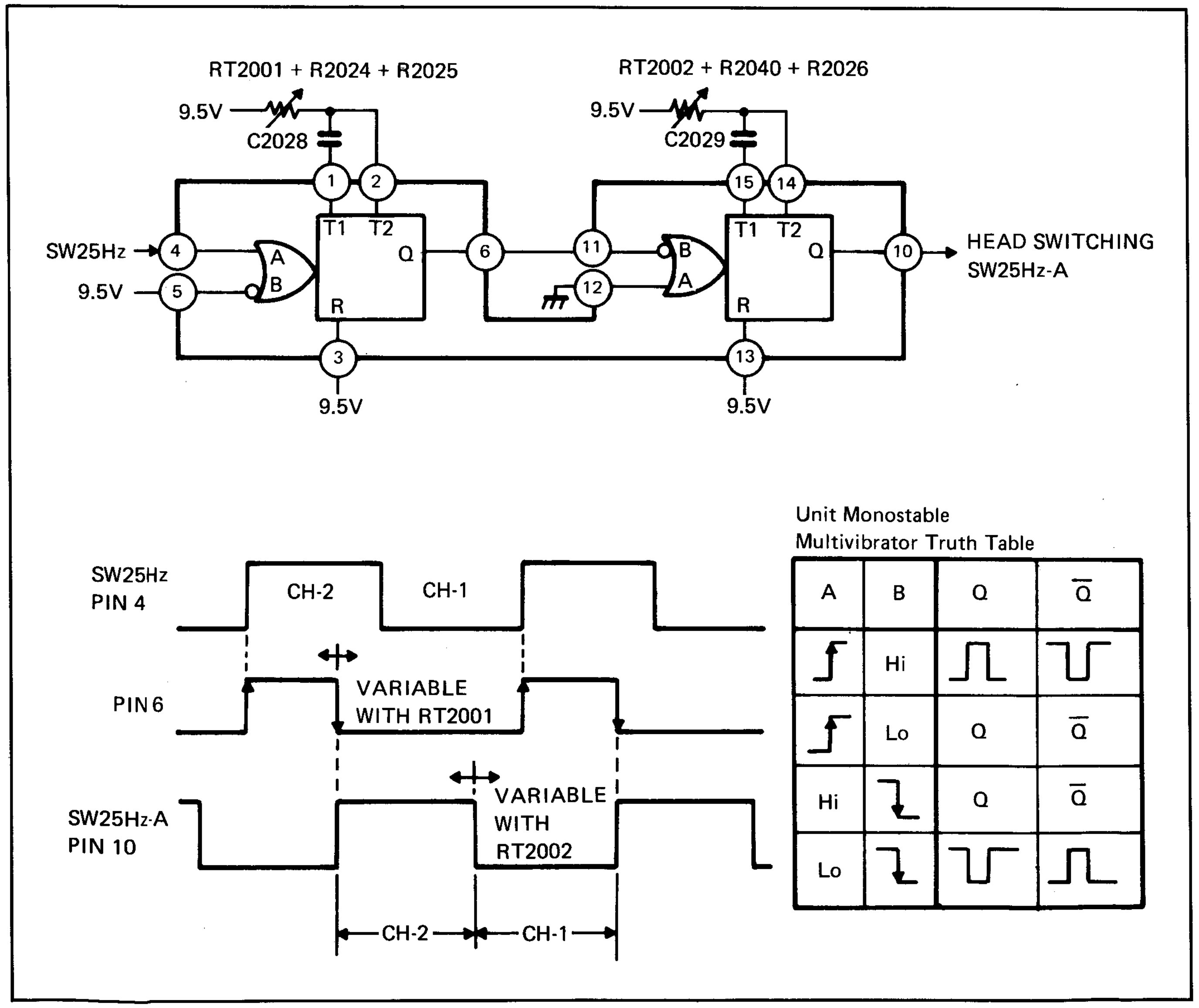
The FM audio head switching pulse is obtained by delaying the SW25 Hz pulse using the 2-stage monostable multivibrators.

- The initial stage monostable multivibrator regulates the delay of the pulse, and
- the pulse width is regulated by the second monostable multivibrator.

As is shown in the timing chart,

- the pulse with the width of C2029 x (RT2002 + R2040 + R2026) is generated at the position.
- C2028 x (RT2001 + R2024 + R2025) with respect to the rise of the SW25 Hz pulse.

The SW25Hz-A pulse is delayed by 120° from the SW25Hz pulse according to the head installation position.



Unit Monostable Multivibrator Truth Table

A	B	Q	$\overline{Q}$
↑	Hi	⊓	⊔
↑	Lo	Q	$\overline{Q}$
Hi	↓	Q	$\overline{Q}$
Lo	↓	⊔	⊓

Fig. 2 FM Audio Head Switching Pulse Generation Circuit

AUDIO FM RECORDING/PLAYBACK SYSTEM

The signal separated into the left and right channels is FM processed at independent carrier frequencies and then is mixed and deep recorded on the video track by the rotary heads in the VHS Hi-Fi system. In the play mode, the L/R separation is performed using the different carrier frequencies and this is demodulated using the respective signal routes then output as the play signal. To perform the above FM processing and recording/playback with the rotary heads,

- The modulator, preemphasis circuit and BPF are provided in the recording system, and
- BPF, amplitude limiter, demodulator, deemphasis circuit and dropout compensator circuit are installed in the play system.

Also a compander system (compression/expansion) noise reduction circuit is installed to improve the S/N.

Carrier noise of 20 dB, FM improvement of 20 dB, emphasis effect of 10 dB and NR effect of 30 dB – a total S/N of 80 dB is obtained by these circuits.

Fig. 3 shows the Hi-Fi audio system block diagram.

The section inside the thick line is a integrated circuit.

The audio signal during recording is level compressed by the compression circuit. Furthermore, after its high frequency is emphasized by the preemphasis circuit, the signal is applied to the clip circuit. The unnecessary component generated by the emphasis action is removed via the clip circuit and the signal is frequency modulated through the FM circuit. The carrier frequency is set to 1.4 MHz ± 50 kHz (maximum deviation is 150 kHz) in the left channel system, and 1.8 MHz ± 50 kHz in the right channel system. The modulated signal is, with the band limited by the BPF, supplied to the FM audio heads.

The FM signal during play is separated into right and left channels via the BPF and is applied to the demodulation system. The detection output is applied to the limiter and the dropout detection circuit. The amplitude of the FM wave is limited in the limiter so that the demodulation action is performed precisely. The noise component is detected by the DO detector as DO (dropout) to suppress noise generated at the head switching point, and the hold amplifier is controlled to maintain the previous value when dropout occurs. The DO detector is also used for detection of the FM signal, and outputs the signal which performs muting or forcibly selects the linear audio output when tracking drifts or when a tape without FM audio recorded is played back. This operation becomes the muting with an FM drop of 10 dB ~ 15 dB and when it is much lower, it drops to the reference level and enters the linear audio selection after approx. 2 seconds. The limiter output is demodulated by the demodulator, applied with play equilization characteristics and fed to the hold amplifier described previously. The switching noise is corrected by the hold amplifier, the audio signal is applied with counter emphasis characteristics via the deemphasis circuit and then sent to the expander in the final stage. The expander performs the level expansion of the signal to improve the S/N by approx. 30 dB and returns it to the play audio signals.

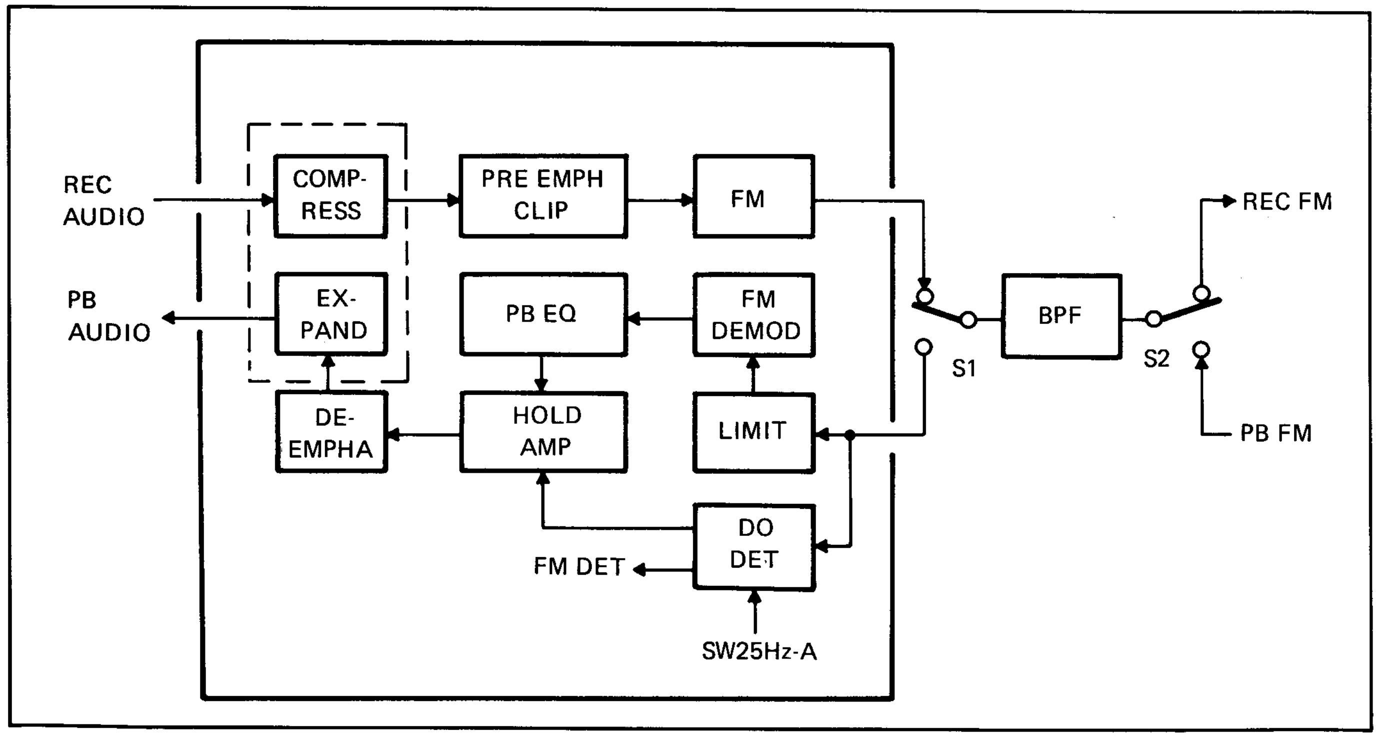


Fig. 3 Hi-Fi 6 Audio System Block Diagram

FM Modulation

Fig. 4 shows the FM audio processing circuit. The following explanation is given for the left channel system, but it differs only with the modulation frequency and circuit numbers in the R channel system; the channel number is shown in ( ) in the figure.

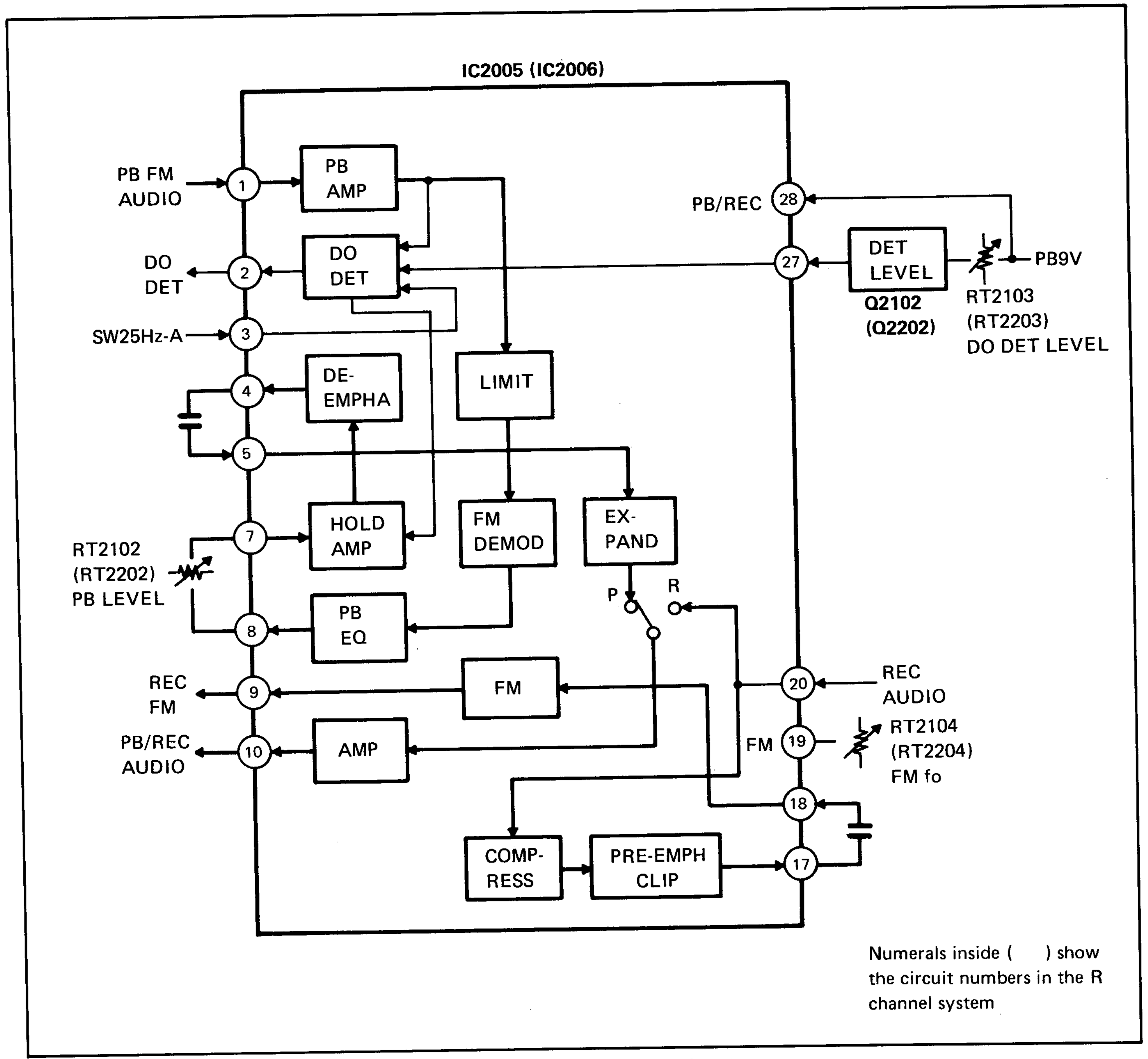
IC2005 is provided with the modulation/demodulation/noise reduction functions; it frequency modulates the signal applied to pin 20 with 1.4 MHz ± 50 kHz (1.8 MHz ± 50 kHz in right channel) and outputs it at pin 9. IC2005 demodulates the FM signal applied to pin 1 and outputs it at pin 10 during playback. It receives the signal via pin 20 and outputs it at pin 10 without modulation during the EE mode and monitoring. The audio signal separated into the L and R channels is input to pin 20. This signal is compressed to 1/2 level by the compressor to give the noise reduction effect during playback. Then, the high frequency of this signal is emphasized by the preemphasis circuit, with the overshoots and undershoots eliminated by the limiter, this signal is derived from pin 17. It is again applied to IC2005 via pin 18 and fed to the modulation circuit. The carrier frequency of the modulation circuit is adjusted by RT2104 at pin 19. This adjustment circuit is only one because the modulation/demodulation oscillator is used in common.

The signal frequency modulated with the carrier of 1.4 MHz ± 50 kHz is output at pin 9 and sent to the rotary head system.

FM Demodulation

Fig. 4 shows the FM audio processing circuit. The playback FM signal applied to pin 1 is fed to the PB amp and amplified to the level suitable for demodulation. The PB amp output is sent to the DO detection circuit and FM demodulation system. The DO detection circuit detects switching noise in the FM signal and presence/absence of the FM signal (discriminates whether or not the tape is FM recorded) based on the audio head switching pulse (SW25 Hz-A) applied to pin 3 and the detection level regulating DC voltage applied to pin 27. When switching noise or dropout is detected, the hold amplifier is operated by the detector output to maintain the played back audio signal in the demodulation system during the noise detection period, and it corrects noise. When the FM signal is not recorded on the tape played back or when the sufficient FM signal cannot be picked up due to drift of the tracking, pin 2 is set to Hi to switch over the FM audio to the linear audio playback. RT2103 is provided to set this detection level. The detection operation becomes the line muting (mutes the output in the final playback stage) when the FM level drops to 10 dB ~ 15 dB, and the playback output is switched over to the linear audio when the FM level drops further.

The amplitude of the signal applied to the FM demodulation system is limited by the limiter. The signal is returned to the original audio signal by the demodulation circuit.



Numerals inside ( ) show the circuit numbers in the R channel system

Fig. 4 FM Audio Processing Circuits

It is further applied with the equalization characteristics and is output at pin 8. The playback level is adjusted by RT2102 and the signal is supplied to the hold amplifier via pin 7. The hold amplifier applies the signal with the noise compensated to the deemphasis circuit. The previously emphasized high frequency is suppressed here, and level is expanded by the expander in the next stage obtaining a noise reduction effect of approx. 30 dB; it is then amplified and output at pin 10.

Noise Reduction

Logarithmic compression/expansion noise reduction is used in this unit to obtain 30 dB or more of NR effect at medium/high frequencies in which noise is most likely to be noticed in view of human hearing.

Fig. 5 shows the noise reduction block diagram.

The same circuit is used in common for recording and playback, and the NR system is mainly composed of the recording operational amplifier, VCA (voltage controlled amplifier) and the peak detector. The gain of the VCA is varied by the control voltage applied from the peak detector. The peak detector detects the peak level of the input signal and lowers the loop gain of the system by raising the gain of the VCA to compress the level when the input is high. This causes the VCA output to be fully emphasized when the input is at a low level.

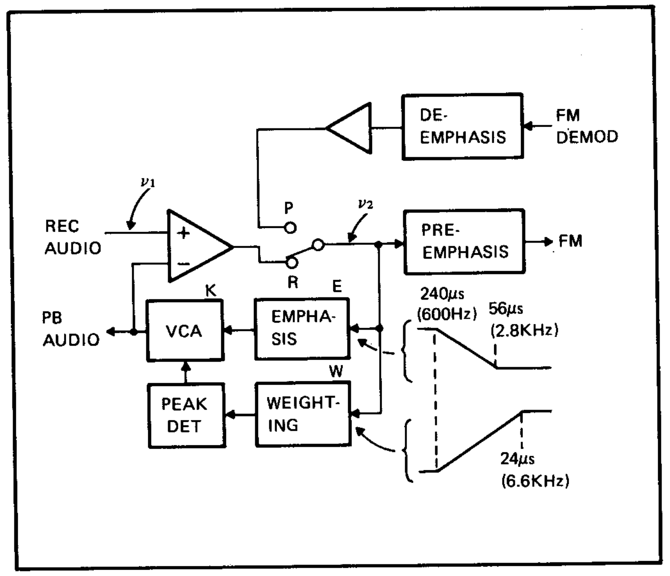


Fig. 5 Noise Reduction Block Diagram

By employing an weighting circuit, the system is also provided with frequency response to remove breathing noise.

Feedback from the VCA and peak detector acts on the operational amplifier during recording, and the relation between the input and output of the recording system becomes as follows assuming the input changes by ν_1.

$$\nu_1 = K\underline{E}\nu_2 \quad = (\underline{EW}) \times \nu_2^2 \leftarrow K = W\nu_2$$

$$\rightarrow \nu_2 \backsim \sqrt{\nu_1}$$

Constant for input signal

As can be seen from the formula, the output change ν_2 is proportional to the square root of the input change ν_1.

This is indicated by dB as $\log\nu_2 \backsim \frac{1}{2}\log\nu_1$; this means that the output (dB) is obtained by logarithmically compressing the input (dB) to 1/2. The signal with this relation is preemphasized and supplied to the FM circuit.

Observing the whole NR system, the emphasis circuit and the weighting circuit cancel each other from the point of view of frequency, but emphasis is applied in the medium-frequency band (2.8 kHz ~ 6.6 kHz). The high-frequency band (more than 6 kHz) is further emphasized by the preemphasis circuit.

During playback, the recording system is shut off and the demodulated signal is given the reverse characteristics to those during recording by the VCA and peak detection circuit, and is returned to the original signal. This operation is shown as follows with double-logarithmic expansion,

$$\begin{aligned} \text{VCA output} &= K\underline{E}\nu_2 \leftarrow K = \underline{W}\nu_2 \\ &= (EW) \times (\nu_2)^2 \\ &= \log(\text{VCA output}) \backsim 2\log\nu_2 \end{aligned}$$

Acts as constant in input/output

The playback output is obtained by doubly expanding the demodulation input.

AUDIO SYSTEM RECORDING/PLAYBACK CIRCUIT OPERATION

The recording/playback routes of the audio signal are the stereo recording/playback system with Dolby-B noise reduction using the fixed heads and the stereo FM recording/playback system using the rotary heads.

Recording Audio Input (BS specifications)

Fig. 6-A shows the recording audio input circuit. Fig. 6-A follows to Fig. 6.

The recording audio signals are the following.

- Tuner audio
- Peri audio
- Line input audio

They are supplied to the input signal selection circuits IC4701 and IC4702 on the jack circuit board.

IC4701 selects the tuner audio or line input audio.

The switching operation of IC4701 is controlled by the input selector switch S902 in the system control circuit. IC4701 provides S1 (R-channel) and S3 (L-channel) for audio signals; S1 performs switching according to the level at pin 6, and S3, the level at pin 13.

The switch operation and selected input signal according to the position of S902 are as shown below.

Position of S902	Switch operation of IC4701		Selected signal
	Levels at pins 6, 13	S1, S3 operations (Selected signal input pins)	
A/V or VTR	Lo	S1: Pin 16 S3: Pin 9	Tuner audio
CAMERA	Hi	S2: Pin 14 S3: Pin 10	Line input audio

With the audio signal selected in this way, the R-channel signal is supplied to the audio circuit from IC4701 pin 1 via the amplifier (Q4703), and the L-channel signal, from IC4701 pin 8 via the amplifier (Q4704) for recording.

[Input selection when presetting channels]

When presetting channels, the tuner audio is automatically selected to monitor broadcasts. The cathode of D4707 on the V.S tuning board becomes Lo when the SELECT/NORMAL switch is set to "SELECT" and IC4701 selects the tuner audio.

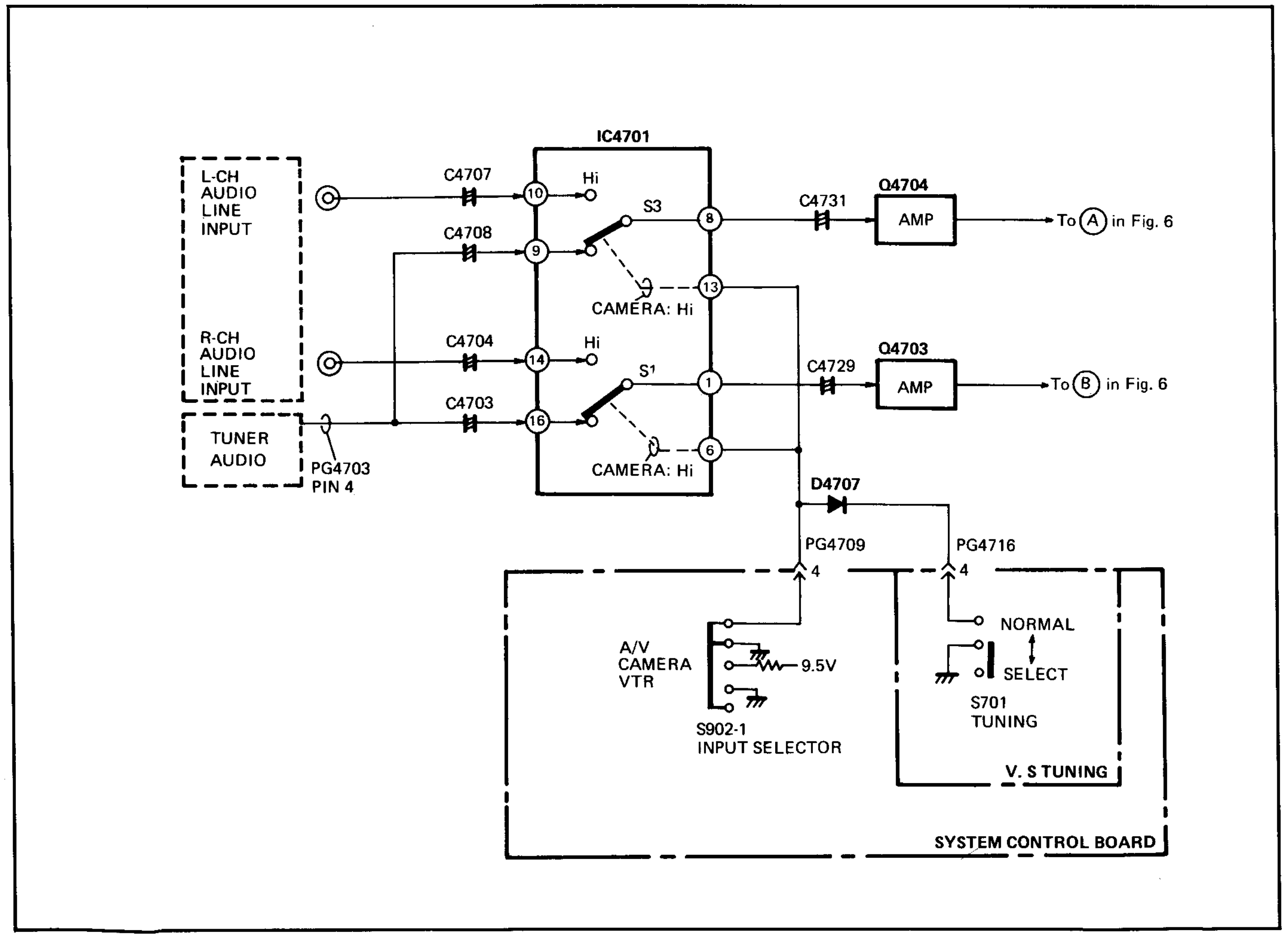

L-CH AUDIO LINE INPUT
R-CH AUDIO LINE INPUT
TUNER AUDIO
PG4703 PIN 4
C4707
C4708
C4704
C4703
IC4701
Hi
S3
CAMERA: Hi
Hi
S1
CAMERA: Hi
10
9
14
16
8
13
1
6
C4731
Q4704
AMP
To Ⓐ in Fig. 6
C4729
Q4703
AMP
To Ⓑ in Fig. 6
D4707
PG4709
PG4716
4
4
A/V
CAMERA
VTR
9.5V
S902-1
INPUT SELECTOR
NORMAL
SELECT
S701
TUNING
V. S TUNING
SYSTEM CONTROL BOARD

Fig. 6-A Recording Audio Input Circuit — BS Specification

Recording Audio Input (E, SEV specifications)

Fig. 6-B shows the recording audio input circuit. Fig. 6-B follows to Fig. 6.

The recording audio signals are the following.

- Tuner audio
- Peri audio
- Line input audio

They are supplied to the input signal selection circuits IC4701 and IC4702 on the jack circuit board.

- IC4701 selects the tuner audio or line input audio, and
- IC4702 selects the signal from IC4701 or the signal from the Peri jack.

The switching operation of the 2 ICs is controlled by the input selector switch S902 in the system control circuit. IC4701 provides S1 (R-channel) and S3 (L-channel) for audio signals; S1 performs switching according to the level at pin 6, and S3, the level at pin 13.

IC4702 provides S1 (R-channel) and S4 (L-channel) for audio signals; both of them perform switching according to the input level at pin 19.

The switch operation and selected input signal according to the position of S902 are as shown below.

Position of S902	Switch operation of IC4701		Switch operation of IC4702		Selected signal
	Levels at pins 6, 13	S1, S3 operations (Selected signal input pins)	Level at pin 19	S1, S4 operations (Selected signal input pins)	
A/V	Lo	S1: Pin 16 S3: Pin 9	Hi	S1: Pin 2 S4: Pin 9	Peri audio
CAMERA	Hi	S2: Pin 14 S3: Pin 10	Lo	S1: Pin 1 S1: Pin 10	Line input audio
VTR	Lo	S1: Pin 16 S3: Pin 9	Lo	S1: Pin 1 S4: Pin 10	Tuner audio

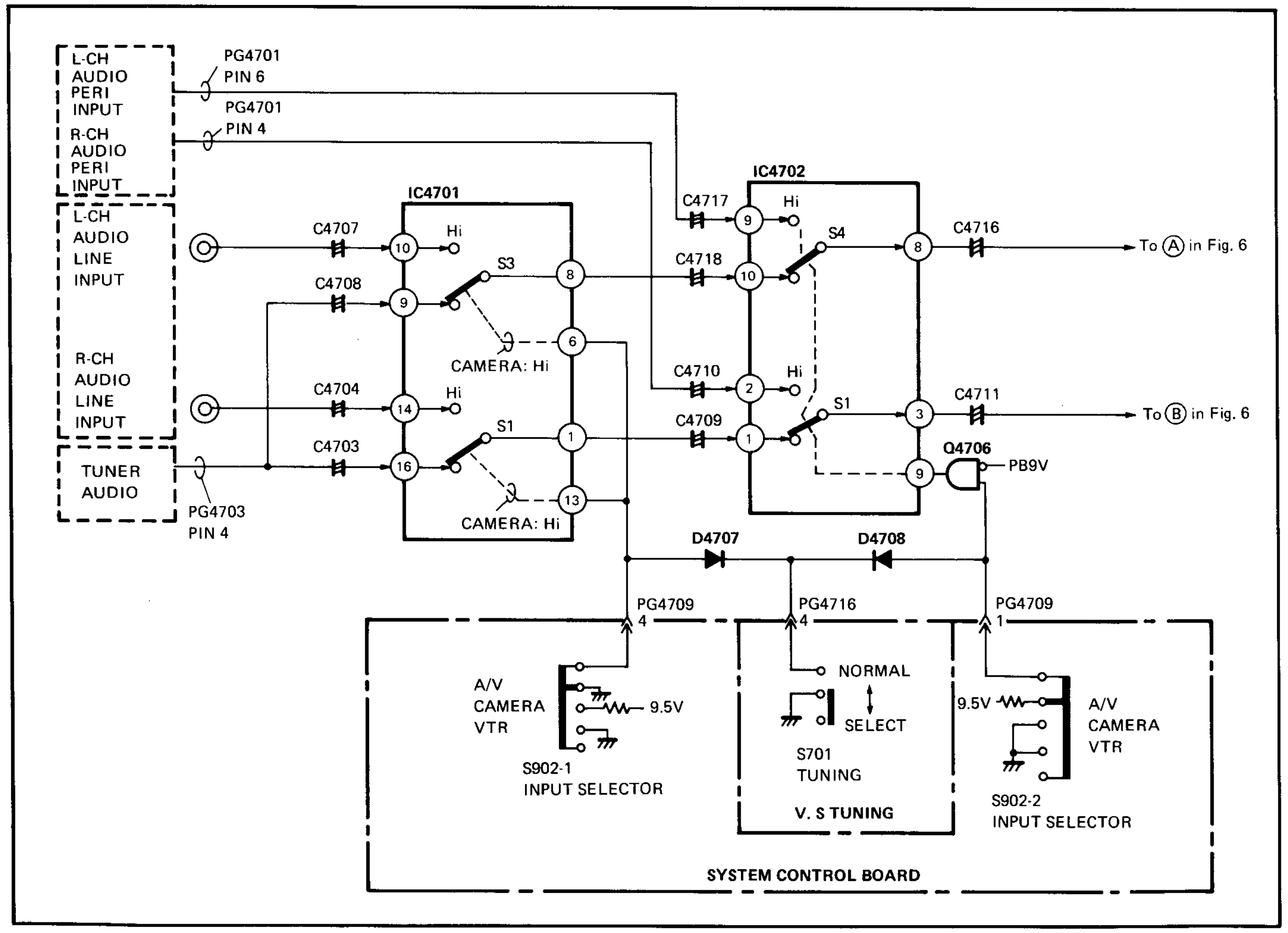

L-CH AUDIO PERI INPUT
PG4701 PIN 6
PG4701 PIN 4
R-CH AUDIO PERI INPUT
L-CH AUDIO LINE INPUT
R-CH AUDIO LINE INPUT
TUNER AUDIO
PG4703 PIN 4
IC4701
C4707
C4708
C4704
C4703
Hi
S3
CAMERA: Hi
Hi
S1
CAMERA: Hi
IC4702
C4717
C4718
C4710
C4709
Hi
S4
Hi
S1
C4716
C4711
Q4706
PB9V
To Ⓐ in Fig. 6
To Ⓑ in Fig. 6
D4707
D4708
PG4709
PG4716
PG4709
4
4
1
A/V
CAMERA
VTR
9.5V
S902-1
INPUT SELECTOR
NORMAL
SELECT
S701
TUNING
V. S TUNING
9.5V
A/V
CAMERA
VTR
S902-2
INPUT SELECTOR
SYSTEM CONTROL BOARD

Fig. 6-B Recording Audio Input Circuit — E and SEV Specifications

With the audio signal selected in this way, the R-channel signal is supplied to the audio circuit via IC4702 pin 3, and the L-channel signal, via pin 8 for recording.

[Input selection when presetting channels]

When presetting channels, the tuner audio is automatically selected to monitor broadcasts. The cathodes of D4707 and D4708 on the V.S tuning board become Lo when the SELECT/NORMAL switch is set to "SELECT" and IC4701 and IC4702 select the tuner audio.

Refer to also Fig. 6 for the following description.

There are 2 audio signal recording methods, manually adjusting the recording level and using the ALC; these can be selected by S903 (Hi-Fi/NORMAL switch) on the system control board. The output from the amplifiers [BS specifications] or IC4702 [E, SEV specifications] is supplied to 2 systems. One is directly supplied to the audio board and the other is supplied to the audio board via the "REC LEVEL CONTROL" on the timer board. The signal supplied to the audio board in this way is selected by the switches in IC2008 depending on the position of switch S903 and is sent to the recording system.

IC2008 incorporates 4 switches S1 – S4:

- When S903 is in the Hi-Fi position, IC2008 turns on S1 and S4.
- When S903 is in the NORMAL position, IC2008 turns on S2 and S4.

The ALC circuit is provided in the output stage of S2 and S3. The circuit controls the input level automatically when S9922 is in the NORMAL position and transmits the signal to the recording system.

The signal flow in each switch position is as follows.

S903: Hi-Fi position → IC2008 pins 12/13: Hi → S1 (for L-CH)/S4 (For R-CH): ON

L-CH AUDIO:

Ⓐ in Fig. 6 → PG4710 Pin 1 → RV101 → Q111 → → PG2036 Pin 1 → IC2007 Pin 4 → AMP → IC2007 Pin 2 → IC2008 Pin 2 → S1 → IC2008 Pin 1 →
→ IC2005 Pin 20 for Audio FM recording
→ Audio circuit for Audio Linear recording

R-CH AUDIO:

Ⓑ in Fig. 6 → PG4710 Pin 3 → RV102 → Q112 → → PG2036 Pin 3 → IC2007 Pin 6 → AMP → IC2007 Pin 8 → IC2008 Pin 10 → S4 → IC2008 Pin 11 →
→ IC2006 Pin 20 for Audio FM recording
→ Audio circuit for Audio Linear recording

S903: NORMAL position → IC2008 Pins 5/6: Hi → →S2 (For L-CH)/S3 (For R-CH): ON

L-CH AUDIO:

Ⓐ in Fig. 6 → PG408 Pin 1 → IC2008 Pin 3 → S2 → IC2008 Pin 4 → IC2005 Pin 25 → ALC → IC2005 Pin 22 →
→ IC2005 Pin 20 for Audio FM recording
→ Audio circuit for Audio Linear recording

R-CH AUDIO:

Ⓑ in Fig. 6 → PG2036 Pin 3 → IC2008 Pin 9 → S3 → IC2008 Pin 8 → IC2006 Pin 25 → ALC → IC2006 Pin 22 →
→ IC2006 Pin 20 for Audio FM recording
→ Audio circuit for Audio Linear recording

[Record level during timer recording]

The audio signal is recorded with the ALC function during timer recording, and the REC LEVEL control is disabled. This is because there is no opportunity to use the REC LEVEL control during timer recording. The ON position of timer switch S1952 is connected to the output of the Hi-Fi/Normal switch (S903) in parallel, so the ALC function works automatically during timer recording.

The record signals applied to IC2005/IC2006 are derived from pin 9; the output from pin 9 is supplied to the FM audio recording system.

IC2005 and IC2006 are the FM-conversion circuit; IC2005 (for L-channel) modulates the audio signal with a carrier frequency of 1.4 MHz between pins 20 and 9, and IC2006 (for R-channel) modulates the audio signal with a carrier frequency of 1.8 MHz between pins 20 and 9.

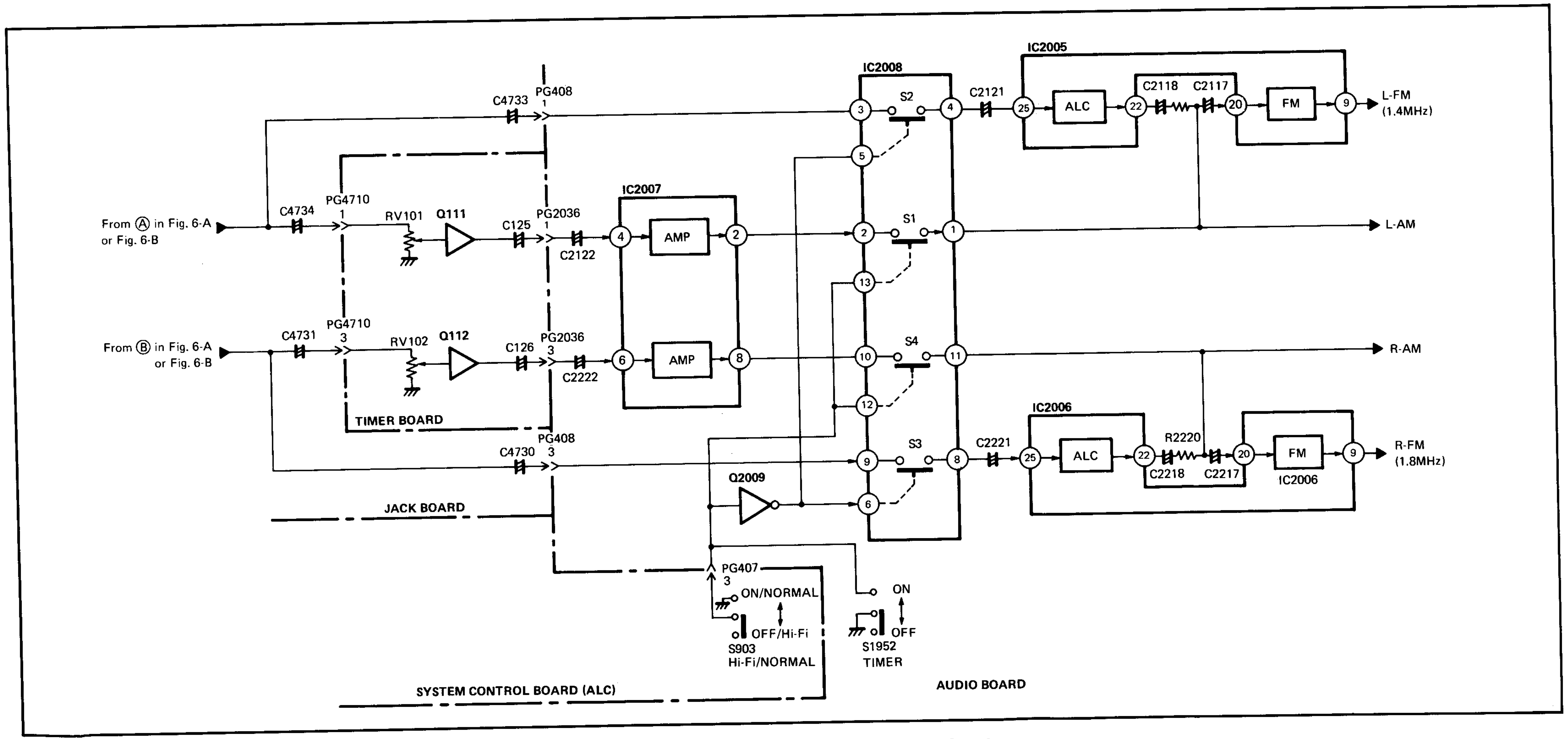

From Ⓐ in Fig. 6-A or Fig. 6-B
From Ⓑ in Fig. 6-A or Fig. 6-B
C4733
PG408 1
C4734
PG4710 1
RV101
Q111
C125
PG2036 1
C2122
C4731
PG4710 3
RV102
Q112
C126
PG2036 3
C2222
TIMER BOARD
PG408 3
C4730
JACK BOARD
IC2007
AMP
AMP
IC2008
S2
S1
S4
S3
C2121
C2221
Q2009
IC2005
ALC
C2118
C2117
FM
L-FM (1.4MHz)
L-AM
R-AM
IC2006
ALC
R2220
C2218
C2217
FM
R-FM (1.8MHz)
PG407 3
ON/NORMAL
OFF/Hi-Fi
S903 Hi-Fi/NORMAL
ON
OFF
S1952 TIMER
SYSTEM CONTROL BOARD (ALC)
AUDIO BOARD

Fig. 6 Recording Audio Input Circuit

Playback Audio Output

Fig. 7 shows the playback audio output circuit.

The audio signal is played back by 4 heads.

- 2 heads are the conventional fixed heads and are used for L and R channel tracks, and,
- The other 2 heads are the helical-scanning FM audio heads installed on the cylinder and are used for CH-1 FM audio/CH-2 FM audio.

The signals detected by the fixed heads are processed in the audio circuit separately for the L and R channels. The detected signals are amplified by the preamplifier IC401. The amplified audio signal is supplied to the output selector circuit IC404 via Dolby decoder IC402. The signal flow to IC404 is as follows.

L-CH AUDIO:
L-CH HEAD → IC401 L PB AMP → IC402 Pin 1→
→ IC402 Pin 17→IC403 S4
→ DOLBY DECODE
→ IC404 Pin 12

R-CH AUDIO:
R-CH HEAD → IC401 R PB AMP → IC402 Pin 2→
→ IC402 Pin 13→IC403 S1
→ DOLBY DECODE
→ IC404 Pin 8

Playback of Hi-Fi audio uses the signals detected by the helical-scanning heads, and is performed in the FM audio circuit. Signals detected by the CH-1/CH-2 heads are amplified and combined by IC2001. The FM wave combined into a continuous signal via IC2001 is demodulated to an audio signal by IC2005/IC2006. When playing back a stereo signal, IC2005 outputs the L channel audio at pin 10 and IC2006 outputs the R channel audio at pin 10.

The FM audio signal obtained in this way is supplied to IC404; the L-channel signal via pin 14 and R-channel signal via pin 10.

Hi-Fi/linear selection of the playback audio signal thus supplied to IC404 is performed by S2 (for L channel) and S1 (for R channel) and the playback output is controlled by S3 and S4. S1 and S2 are changed over according to the level at pin 4, and S3 and S4 are changed according to the level at pins 1, 2 and 3.

Output selector IC404 receives the L-channel audio signal via pin 16 and the R-channel audio signal via pin 11.

These signals are sent to the line amplifiers in IC401 L/R respectively.

The outputs from the line amplifiers are;

- sent to the headphone amplifier (IC406),
- derived from the headphone jack, and
- supplied via PG409 to the output system on the jack board.

The level indicator as well as the LINE jack/PERI jack (For E, SEV specifications)/RF converter output systems are installed on the jack board so that the output level can be indicated.

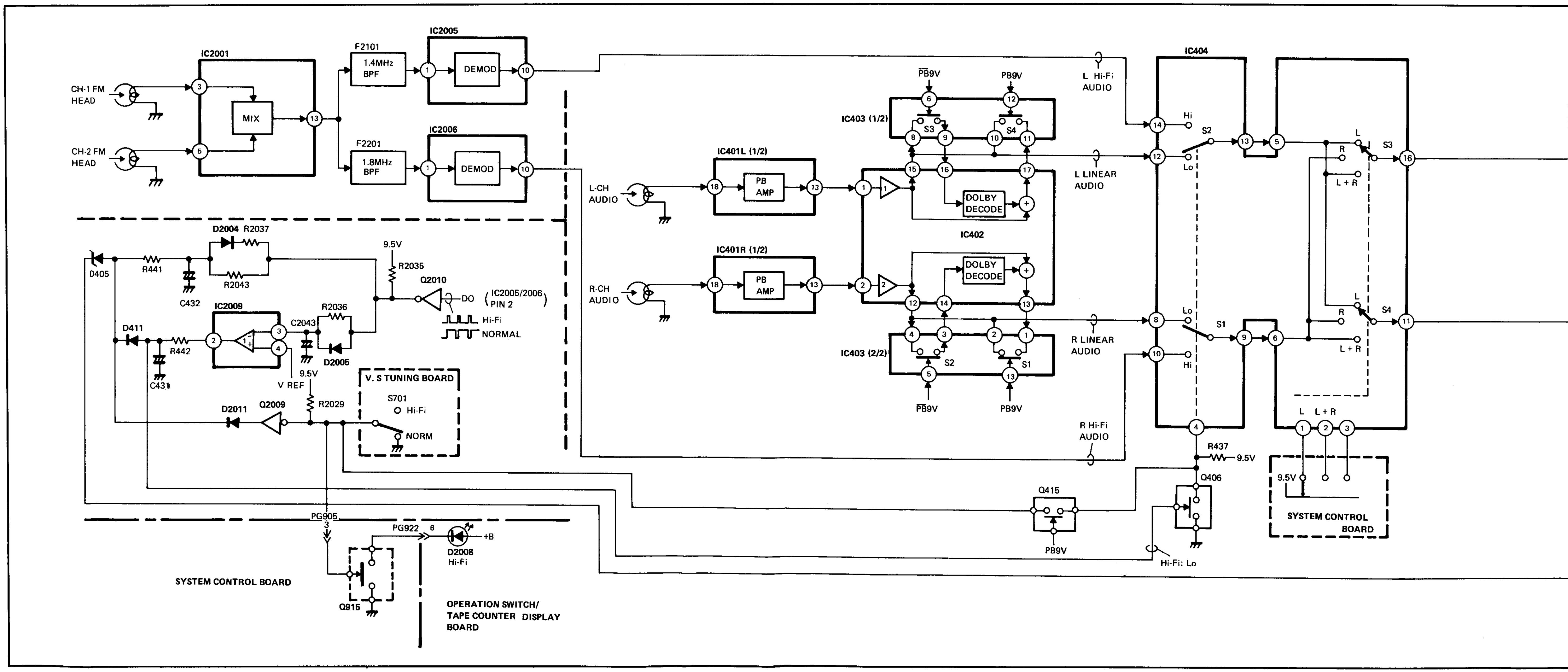

CH-1 FM HEAD
CH-2 FM HEAD
IC2001
MIX
F2101
1.4MHz BPF
F2201
1.8MHz BPF
IC2005
IC2006
DEMOD
D2004 R2037
D405
R441
R2043
C432
IC2009
R2036
C2043
D2005
D411
R442
C431
9.5V
R2035
Q2010
DO
IC2005/2006 PIN 2
Hi-Fi
NORMAL
V REF
D2011
Q2009
R2029
V. S TUNING BOARD
S701
Hi-Fi
NORM
PG905
PG922
D2008 Hi-Fi
+B
SYSTEM CONTROL BOARD
Q915
OPERATION SWITCH/ TAPE COUNTER DISPLAY BOARD
L-CH AUDIO
R-CH AUDIO
IC401L (1/2)
IC401R (1/2)
PB AMP
IC402
DOLBY DECODE
IC403 (1/2)
IC403 (2/2)
PB9V
S1
S2
S3
S4
L Hi-Fi AUDIO
L LINEAR AUDIO
R LINEAR AUDIO
R Hi-Fi AUDIO
IC404
Hi
Lo
L
R
L+R
R437
Q406
Q415
Hi-Fi: Lo
SYSTEM CONTROL BOARD

Fig. 7 Playback Audio Output Circuit

Selection between Hi-Fi audio and linear audio

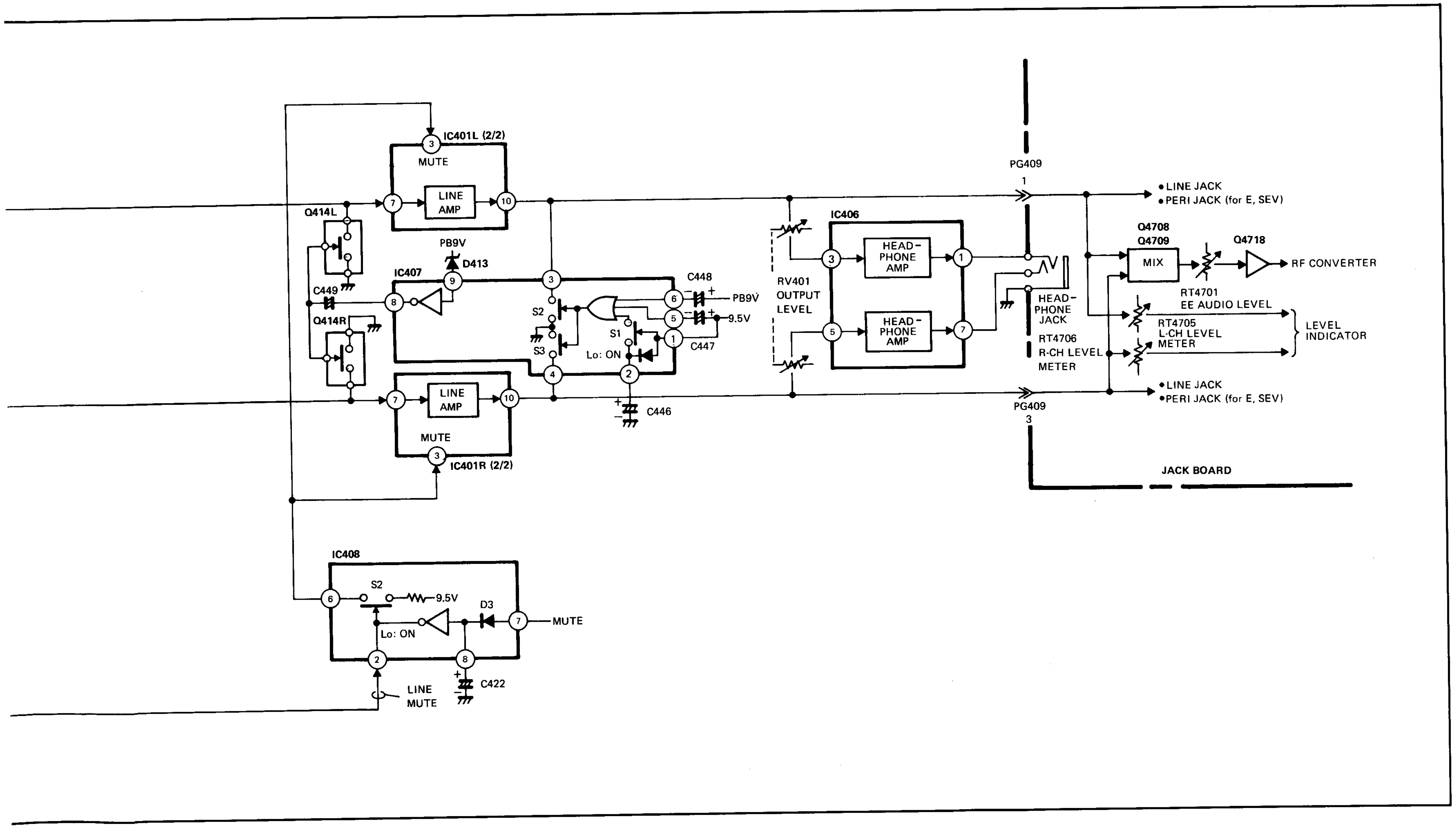
Selection of the Hi-Fi audio or linear audio is as follows depending on various conditions, the Hi-Fi/NORMAL switch (S701) position and the played back tape, etc. When the switch is set to "Hi-Fi", Hi-Fi indicator D2008 on the operation switch/tape counter display board lights.

Tape Played	S701	Selected Output	Reason
Hi-Fi	Hi-Fi	Hi-Fi	Q406: OFF Q415 collector: Hi
NORMAL	Hi-Fi	NORMAL	Q406: ON
Hi-Fi	NORMAL	NORMAL	Q415 emitter: Lo
NORMAL	NORMAL	NORMAL	Q406: ON Q415 emitter: Lo

S1 and S2 are switched over according to the input level at pin 4. Pin 4 becomes Hi only in the following conditions:

- When a Hi-Fi tape is played back with the Hi-Fi/NORMAL select switch set to "Hi-Fi", and
- The playback output level of the FM track is sufficient (Q406: off).

When S701 is set to the "Hi-Fi position during play, the output (IC404 pin 4 side) from Q415 becomes Hi when Q406 is off (FM audio signal is sufficient). Q406 turns off when the FM audio signal is insufficient because IC2009 pin 2 becomes Lo.



Stereo/Monaural output selection

The signal selected by S1 and S2 is sent to switches S4 and S3 in the next stage in IC404, and the stereo/monaural output selection is done.

The positions of S2 and S4 are changed over according to the input levels at pins 1, 2 and 3 of IC404.

The input condition is determined by S901 (L/L+R/R) on the system control board. When S7905 is in the "L" position, the L-channel signal is output to both channels. When S7905 is in the "R" position, R-channel signal is output to both channels. In the (L + R) position, respective channel signals are output to the respective channels separately (stereo).

Muting operation

The muting circuit composed of Q404 L/R is installed in the output stage of IC404. Q414 L/R suppress the noise occurring when the stop operation is performed in the playback mode and the tuner audio is selected. Q414 L/R turn on for the period determined by C449 when playback is switched to stop.

The muting circuit composed of IC407 is installed in the output stage of the line amplifiers in IC401 L/R. The 9.5V power voltage and PB9V are OR-connected to S2 and S3 to perform muting just after power is supplied, just after playback starts and just after power is turned off.

The muting circuit composed of IC408 is connected to the amplifiers in IC401 L/R. IC408 outputs Hi at pin 6 during muting. IC401 L/R receive this Hi via pins 3 and mute line amplifiers when IC401 L/R operate in the play mode, and mute the record amplifiers in the record mode.

The state of IC408 is determined by the MUTE: Hi (signal output from the system control μP and is Hi during loading or trick play) applied to pin 7 and the state of pin 2.

The level obtained by rectifying the dropout level derived from the FM audio circuit is supplied to pin 2. When S701 is in the Hi-Fi position, D2011 turns off. When dropout occurs in this state, S2 is turned on for a moment by the signal route, IC408 pin 2 → D405 → R441 → C432 → GND, and the audio signal is muted so that noise following the dropout does not enter the output system.

Q413 is controlled by the MUTE signal generated by the system control μP and the FM AUTO signal from the FM audio circuit;

- muting is performed by the MUTE signal during loading and trick play, and
- muting is performed by the LINE MUTE signal* when tracking drifts too much.

* LINE MUTE signal: This is obtained from the FM audio circuit, and is set to Lo when the FM envelope drops too much from the specified level. This drop is approx. 10 dB ~ 15 dB from 1/3 to 1/5 approximately. When the FM drop is more than the above, it is judged that there is no FM envelope, the FM MUTE signal returns to Hi, and the playback output is obtained from the linear audio track.

FM Audio Recording

Fig. 8 shows the FM audio recording circuit.

FM processing during recording is performed by IC2005 for the L-channel system (monaural: L + R, stereo: L) and by IC2006 for the R-channel (monaural: L + R, stereo: R). As for FM processing, the carrier frequency of the L-channel is 1.4 MHz and the carrier frequency of the R-channel is 1.8 MHz, so these components are passed through the bandpass filters and then applied to the mixer to supply them to the heads.

The bandpass filter is used in common for recording and playback, and is switched using a diode. Switching operation by recording/playback is as follows.

The signal whose frequency band is specified by the bandpass filter is sent to IC2002 after its record current is adjusted by RT2101 (for L-channel) and RT2201 (for R-channel).

The L-channel FM audio is supplied to the mixer while being mixed with the R-channel signal, so buffer Q2007 is provided. IC2002 is composed of the mixer, record start circuit and record amplifier; it mixes the L and R signals applied from pin 9 and 13. The signal mixed here is fed to the record amplifier via the record start circuit. The record start circuit receives the MUTE signal (Loading: Hi) generated by the system control μP via pin 7 so that the signal is not applied to the record amplifier during loading. The record amplifier amplifies the mixed output and supplies it to the CH-1/CH-2 FM audio heads.

Mode	Channel	Active Elements	Nonactive Elements
Recording	L	D2104/D2101	D2102/Q2101
	R	D2204/D2201	D2202/Q2201
Playback	L	D2102/Q2101	D2104/D2101
	R	D2102/Q2201	D2204/D2201

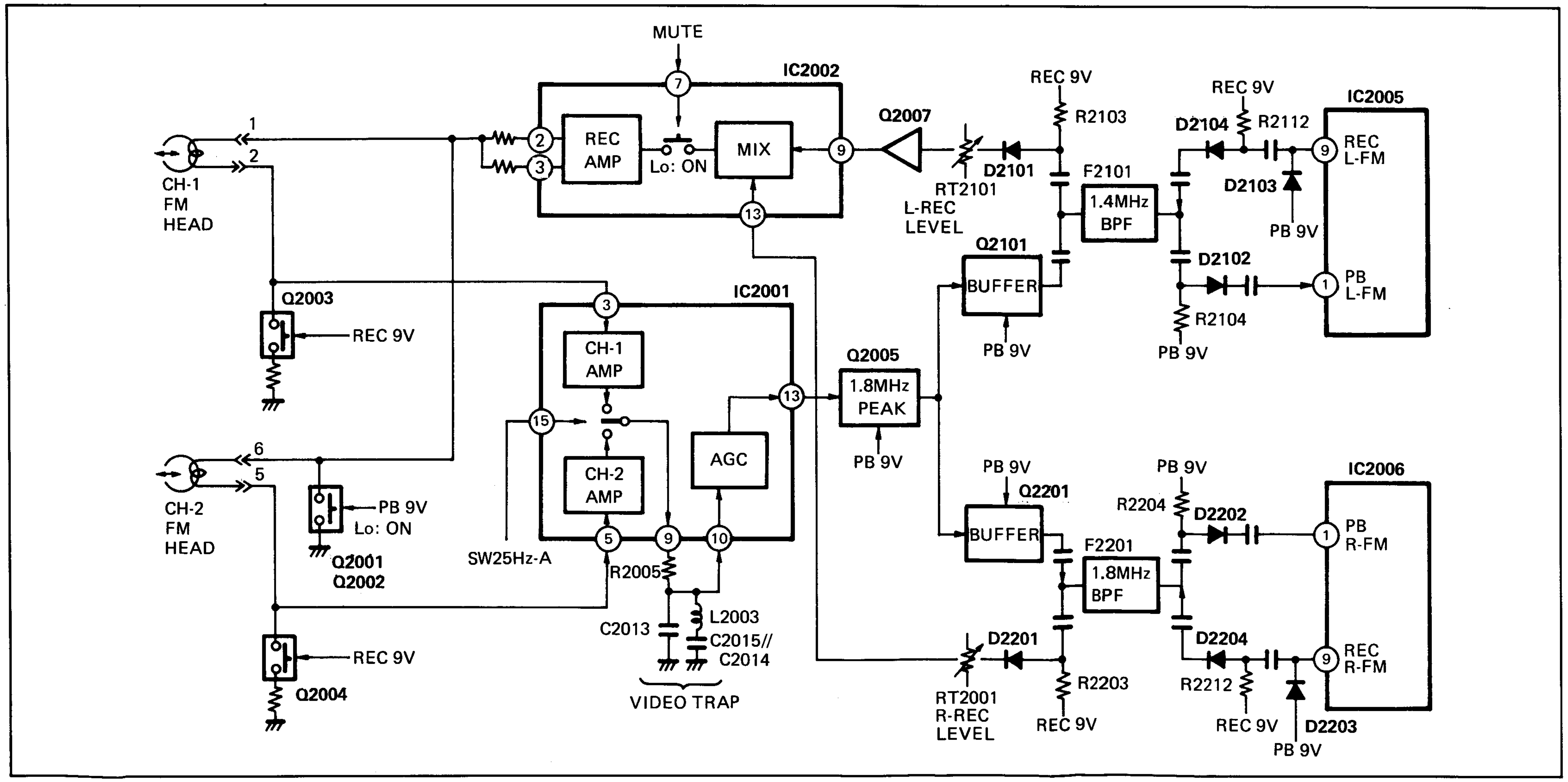


Fig. 8 FM Audio Record/Playback Circuit

The head switching circuit is inserted into CH-1/CH-2 of the FM heads to perform switching operation in different modes. For CH-1, Q2003 turns on during recording to form the head recording configuration. For CH-2, Q2004 turns on during recording to form the head recording configuration.

FM Audio Playback

Fig. 8 shows the FM audio playback circuit.

Q2001 and Q2002 turn on during playback and the heads have the playback configuration. The signals obtained from CH-1 and from CH-2 are applied to IC2001 and combined to form the continuous signal.

IC2001 switches the CH-1 signal and CH-2 signal sent from the heads by use of SW25Hz-A signal and combines them. This combined signal becomes an even signal with the level difference between channels suppressed by the AGC circuit in the next stage.

The SW25Hz-A signal is obtained by delaying the video head switching signal using the FM audio head switching signal. R2005, C2013, C2014, C2015 and L2003 compose a video trap which removes unnecessary components in the signal components (mainly the signals detected from the video track) detected by the audio heads.

Q2005 applies peaking slightly to the 1.8 MHz component of the combined signal obtained by IC2001. Then the combined signal is applied to the bandpass filter through which the signal passes during recording to separate it into L and R channels. The bandpass filter makes the L channel component of the combined signal pass by operation of Q2101/D2102 for the L-channel and makes the R-channel component pass by the operation of Q2201/D2202 for the R-channel. The signal thus obtained is applied to IC2005/IC2006 and is demodulated.

FM Audio Control

The following is the object of control when playing back FM audio.

- When the output select switch (Hi-Fi/NORMAL) is set to "Hi-Fi", Hi-Fi audio is played back from an FM recorded tape.
- The indicator is lit during Hi-Fi audio playback.
- When a sharp drop in FM occurs during Hi-Fi audio playback, muting operation is performed.

Fig. 9 shows the FM audio control signal generation circuit.

The control signal for the operations shown above is obtained by detecting the signal generated in the DO circuit of IC2005 in the FM audio circuit using Q2010 and IC 2009.

The signal obtained at pin 2 of IC2009 becomes Lo when the FM output is sufficient because of the Hi-Fi audio output. On the other hand, when the FM output drops by 15 ~ 20 dB, it becomes Hi because of the linear audio output.

The Hi-Fi audio and linear audio can be selected by the output select switch in the V.S tuning circuit. When this switch is set to "NORMAL", "NORMAL: Hi" is supplied to the audio board and the linear audio is output. The anode of D2004 is set to Lo when a sharp FM drop (approx. 10 ~ 15 dB) occurs because of tracking drift, etc. and this is supplied to the audio circuit to mute the output system.

The control signal shown above is obtained as follows.

The DO detector in IC2005/IC2006 generates the DO detection pulse at pin 2. This pulse becomes the pulse with a greater width when the noise region is wider. On the other hand, only the switching noise with narrow width is generated during FM play when the tracking condition is best. This pulse detection operation level is adjusted by changing the DC level applied to the detector by RT2103/RT2203 connected to the bases of Q2102/Q2202.

FM audio playback

The DO pulse width is narrow and the "on" period of Q2010 is short during FM audio playback. The voltage charging C2043 during the "off" period of Q2010 is discharged via R2036 during the "on" period.
Q2010 turns off again midway in this discharging, and C2043 is charged. The level at pin 3 of IC2009 does not drop lower than the level at pin 4 in this operation and pin 2 becomes Lo. (FM AUTO: Lo).

Muting caused by FM drop

The DO pulse width gets wider when an FM drop occurs.
Taking into consideration the charge (Q2010 OFF) and discharge (Q2010 ON) of C2043 and C432, the following formula is established.

When the DO pulse width gets wider than that specified (FM output gets lower), the smoothing level at pin 3 is higher than the level at pin 4 (FM AUTO: Lo), but the anode of D2004 becomes Lo (LINE MUTE: Lo). Following these operations, the FM audio is played back or the output route is shut off by the line mute signal.

Linear Audio Output

When the FM drop becomes greater or the FM signal is not detected, the condition shown above advances further and the level at pin 3 of IC2009 gets lower than the level at pin 4. This causes the FM AUTO also to be Lo, and Hi-Fi output is changed over to linear audio output.
The Hi-Fi output has precedence in this system but the resistance of R2036 is greater, so when the FM drop occurs during playback, it takes approx. 2 seconds to switch over from Hi-Fi output to linear audio output.

	C2043 (FM AUTO system)		C432 (LINE MUTE system)	
	Charge	Discharge	Discharge	Charge
Charge/discharge circuit	R2035/D2005	R2036/Q2010	R2035/R2043	D2004/R2037/Q2010
Charge/discharge time	Short	Long	Long	Short

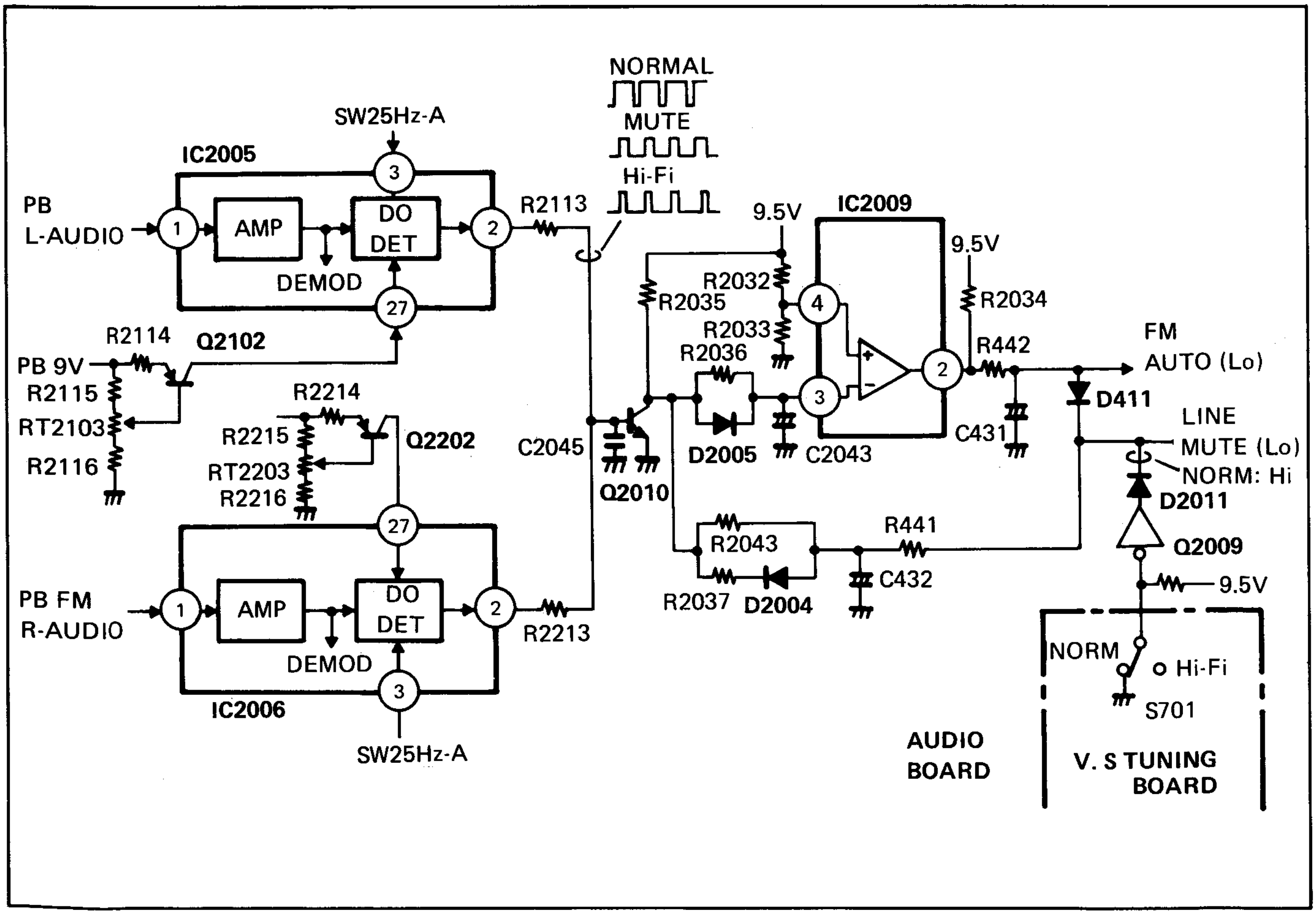

NORMAL
MUTE
Hi-Fi
SW25Hz-A
IC2005
PB L-AUDIO
1
AMP
DO DET
3
2
DEMOD
27
R2113
9.5V
IC2009
9.5V
R2032
R2035
4
R2034
R2033
R2036
FM AUTO (Lo)
R442
2
3
D411
LINE MUTE (Lo)
NORM: Hi
D2011
Q2009
9.5V
R2114
Q2102
PB 9V
R2115
RT2103
R2116
R2214
R2215
Q2202
RT2203
R2216
C2045
Q2010
D2005
C2043
C431
R2043
R441
C432
R2037
D2004
PB FM R-AUDIO
1
AMP
DO DET
2
R2213
DEMOD
27
3
IC2006
SW25Hz-A
NORM
Hi-Fi
S701
AUDIO BOARD
V. S TUNING BOARD

Fig. 9 FM Audio Control Signal Generation Circuit

Linear Audio Recording

Fig. 10 shows the linear audio recording circuit.

The linear audio record signals are supplied to IC401 L/R pins 14 separately for L and R channels and sent to the fixed heads.

Switching the audio circuit to the record mode is done for the configuration of the amplifiers in IC401 L/R, IC403 (for Dolby circuit) and the fixed heads. Switching of these circuits is controlled by the PB9V (signal obtained from the regulator circuit being Hi in the play mode) and the outputs from IC408 pins 1 and 3.

PB9V is used for switching IC403 and inputting the signals obtained at IC408 pins 1 and 3. The output at pin 1 is used for mode switching or IC401 L/R and the output at pin 3 is used for head switching.

Record mode switching and signal route

Since PB9V becomes Lo in the record mode, IC408 pins 1 and 3 are Lo and the PB9V line is Hi. This causes the following signal route to be established.

IC408 Pin 1 : Lo → IC401 L/R Pins 2: Lo → IC401 L/R are configured in the record mode and the record amplifier and line amplifier are actived.

IC408 Pin 3: Lo
PB9V: Hi
→ IC403 S2/S3: ON → Dolby encoding
→ IC405 L/R S2: ON → Heads are configured in the record mode.

The signals are supplied to the heads via the following routes by the switching operations shown above. L/R in suffixes are omitted in the following description. When L and R differ, description is made for L and R separately.

IC401 Pin 14 → S1 → IC401 Pin 13 → RT402L → L403L
↑
ALC

(L channel)

→ IC402 Pin 1 → AMP 1 → ⊕ → Pin 19 → RT403L →
↑
DOLBY DECODING
→ IC401L Pin 5 → REC AMP → Pin 4 → L-CH HEAD

(R channel)

→ IC402 Pin 2 → AMP 2 → ⊕ → Pin 18 → RT403R →
↑
DOLBY DECODING
→ IC401R Pin 5 → REC AMP → Pin 4 → R-CH HEAD

ALC operation

The ALC operation during linear audio recording acts as the loop below.

(L channel)

IC402 Pin 15 → IC403 Pin 8 → S3 → Pin 9 →
→ IC404 Pin 12 → Pin 16 → IC401 Pin 7 →
→ LINE AMP → ALC → REC AUDIO LEVEL CONTROL
→ Pin 10 → REC MONITOR

(R channel)

IC 402 Pin 12 → IC403 Pin 4 → S2 → Pin 3 →
→ IC404 Pin 8 → Pin 11 → IC401R Pin 7 →
→ LINE AMP → ALC → REC AUDIO LEVEL CONTROL
→ Pin 10 → REC MONITOR

Dolby operation

IC402 is a dual Dolby encoder – decoder circuit with a B-type Dolby noise reduction system provided for the L and R channels. IC402 forms the encode/decode loops using the PB/REC switches in the peripheral component, IC403 and performs encoding/decoding when Hi is applied to pin 7. The operation is as follows. Taking the L-channel as an example, the output from amplifier 1 is supplied to the variable filter via S3 in IC403 during recording, and encoded and compared with the output from amplifier 1. The signal with its high frequencies boosted is output at pin 19 as the encoded signal.

Linear Audio Playback

Fig. 10 shows the linear audio playback circuit.

The linear audio playback signal is picked up by each head, amplified and played back. The linear or Hi-Fi audio output is selected by IC404 and is obtained at IC407 pin 10.

Switching the audio circuit to the play mode is done for the configuration of the amplifiers in IC401 L/R, fixed heads and IC403 (for Dolby circuit). Switching of these circuits is controlled by the PB9V (signal obtained from the regulator circuit being Hi in the play mode) and the outputs from IC408 pins 1 and 3.

PB9V is used for switching IC403 and inputting the signals obtained at IC408 pins 1 and 3. The output at pin 1 is used for mode switching of IC401 L/R and the output at pin 3 is used for head switching.

Play mode switching and signal route

Since PB9V becomes Hi in the play mode, IC408 pins 1 and 3 are Hi and the PB9V line is Lo. This causes the following signal route to be established.

IC408 Pin 1: Hi → IC401 L/R Pins 2: Hi → IC401 L/R are configured in the play mode and the playback amplifier and line amplifier are activated.

IC408 Pin 3: Hi
PB9V: Lo
→ IC403 S1/S4:
ON →Dolby decoding
→ IC405 L/R S1:
ON → Heads are configured in the play mode.

The signals are supplied to the heads via the following routes by the switching operations shown above. L/R suffixes are omitted in the following description.
When L and R differ, description is made for L and R separately.

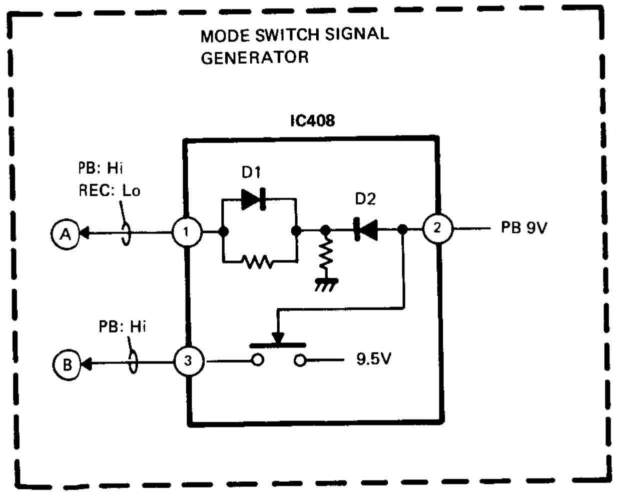
AUDIO HEAD → IC401 Pin 18 → PB AMP → Pin 17 → RT401 (Playback level Adjustment) → IC401 Pin 15 → S1 → Pin 13 → RT402L (Dolby input level Adjustment) → L403

(L channel)

→ IC402 Pin 1 → AMP 1 →⊕→ Pin 17 → IC403 Pin 11 → S4 → Ⓐ
Ⓐ→ Pin 10 → IC402 Pin 16 → DOLBY DECODING
→ IC404 Pin 12 → Pin 16 → IC401L Pin 7 → LINE AMP → Ⓑ → Pin 10 → → AUDIO OUT

(R channel)

→ IC402 Pin 2 → AMP 2 →⊕→ Pin 14 → IC403 Pin 1 → S1 → Ⓐ
Ⓐ→ Pin 2 → IC402 Pin 14 → DOLBY DECODING
→ IC404 Pin 8 → Pin 11 → IC401R Pin 7 → LINE AMP → Pin 10 → → AUDIO OUT


MODE SWITCH SIGNAL GENERATOR
IC408
PB: Hi
REC: Lo
PB: Hi
D1
D2
PB 9V
9.5V
A
B

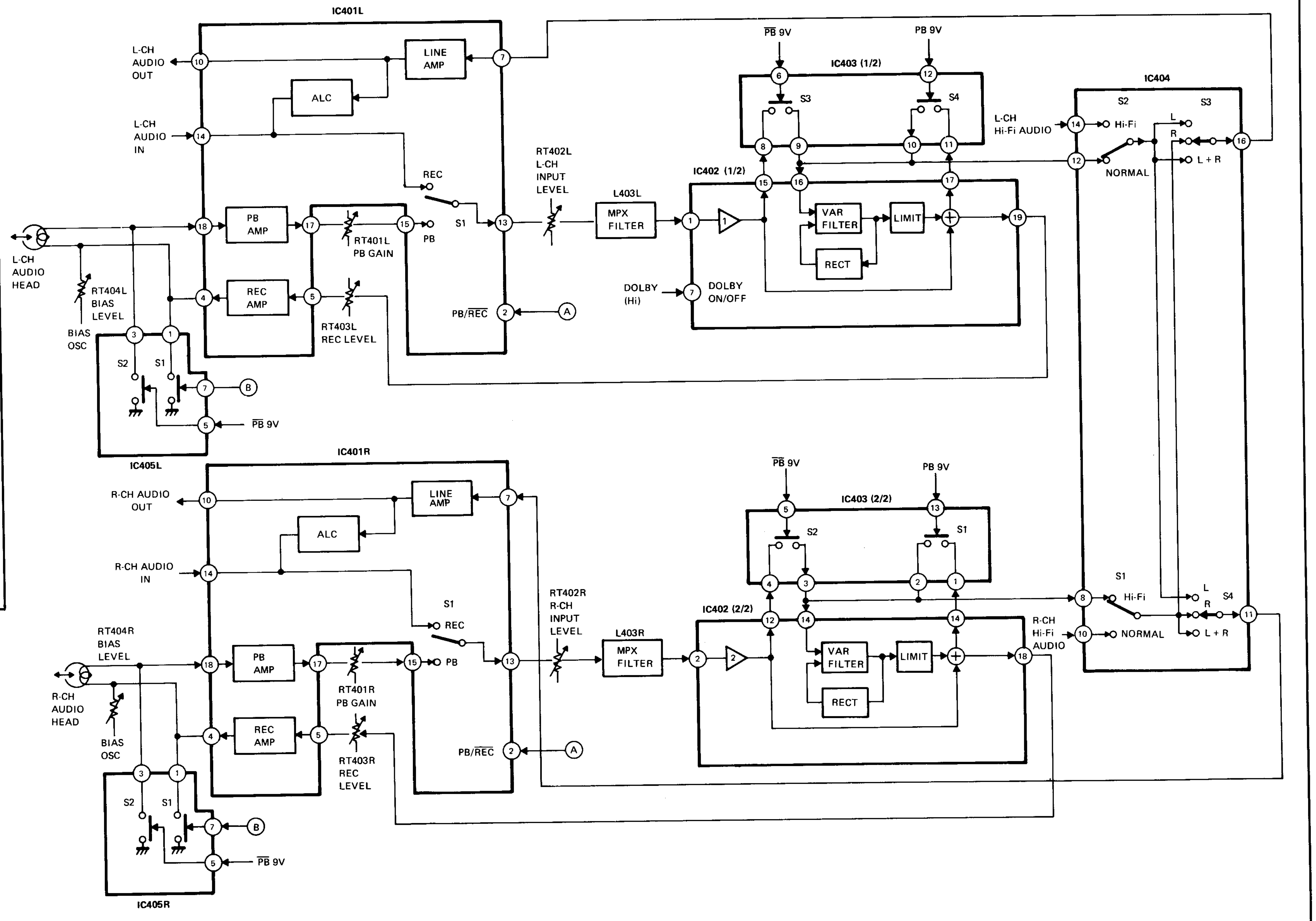

IC401L
L-CH AUDIO OUT
L-CH AUDIO IN
LINE AMP
ALC
PB AMP
REC AMP
REC
PB
S1
RT401L PB GAIN
RT403L REC LEVEL
PB/REC
L-CH AUDIO HEAD
RT404L BIAS LEVEL
BIAS OSC
IC405L
S2
S1
PB 9V
RT402L L-CH INPUT LEVEL
L403L
MPX FILTER
IC402 (1/2)
DOLBY (Hi)
DOLBY ON/OFF
VAR FILTER
LIMIT
RECT
IC403 (1/2)
S3
S4
IC404
L-CH Hi-Fi AUDIO
Hi-Fi
NORMAL
L
R
L + R
IC401R
R-CH AUDIO OUT
R-CH AUDIO IN
RT401R PB GAIN
RT403R REC LEVEL
R-CH AUDIO HEAD
RT404R BIAS LEVEL
IC405R
RT402R R-CH INPUT LEVEL
L403R
IC402 (2/2)
IC403 (2/2)
R-CH Hi-Fi AUDIO

Fig. 10 Linear Audio Recording / Playback Circuit

ATR (Audio Tape Recorder) Operation

This unit is provided with the function (ATR) to FM-record only the audio signal without recording the video signal as an audio tape recorder.

The ATR mode is entered when the ATR/INDEX switch (S905) on the system control board is set to ATR, and only the audio signal is recorded at the LP speed (1.17 cm/sec: half the SP speed). A sync signal generator is provided exclusively for the ATR mode. The sync signal and the color subcarrier frequency are generated by this generator in the video system to perform the normal servo operation during recording, and meanwhile, the CTL pulse is recorded as usual to perform the servo operation precisely during play.

Fig. 11 shows the ATR circuit.

To perform the ATR operation, the signal (ATR: Hi) generated by the ATR/VTR switch operation is supplied to the video system, servo system, system control circuit and the V sync generator (to generate the V sync signal because it is not output in the ATR mode) via the jack board, to control the following operations.

In the video system, the record current is suppressed by D211 and the output of the monitor video is inhibited by D210.

In the servo system:

- By activation of Q613, the CFG divider operates as a 1/12 divider (1/24 division in the SP mode), and the capstan phase control system operates the same as in the LP mode. This causes the phase control system to operate normally.
- By activation of Q614, the search preset resistors are switched out of the circuit.
- By activation of Q614, pin 13 of IC604 (Capstan Speed Control) becomes Hi and the capstan speed is locked to 1/2 the normal speed.

In the system control circuit, the ATR indicator (LD902) on the left switch board is lit.

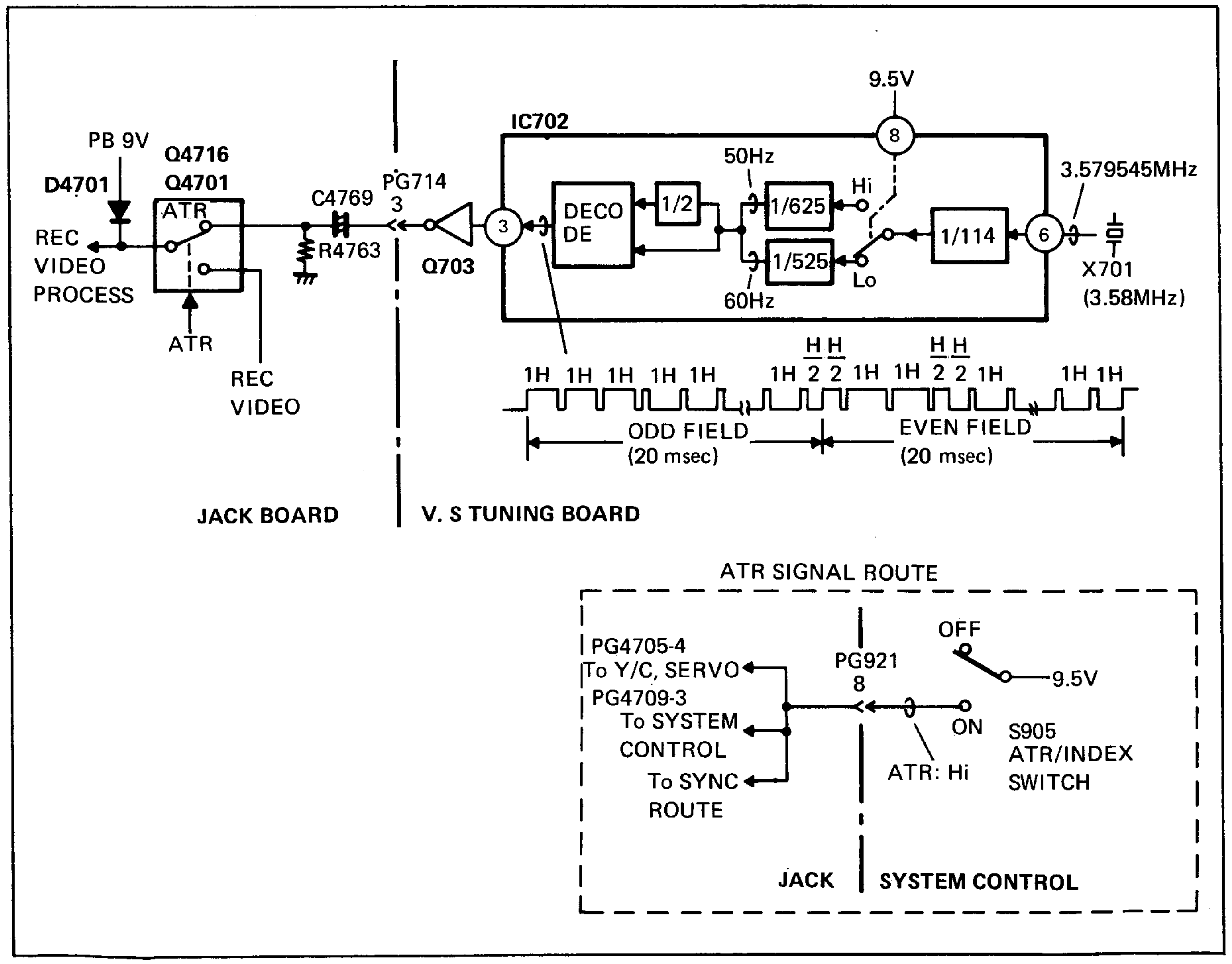
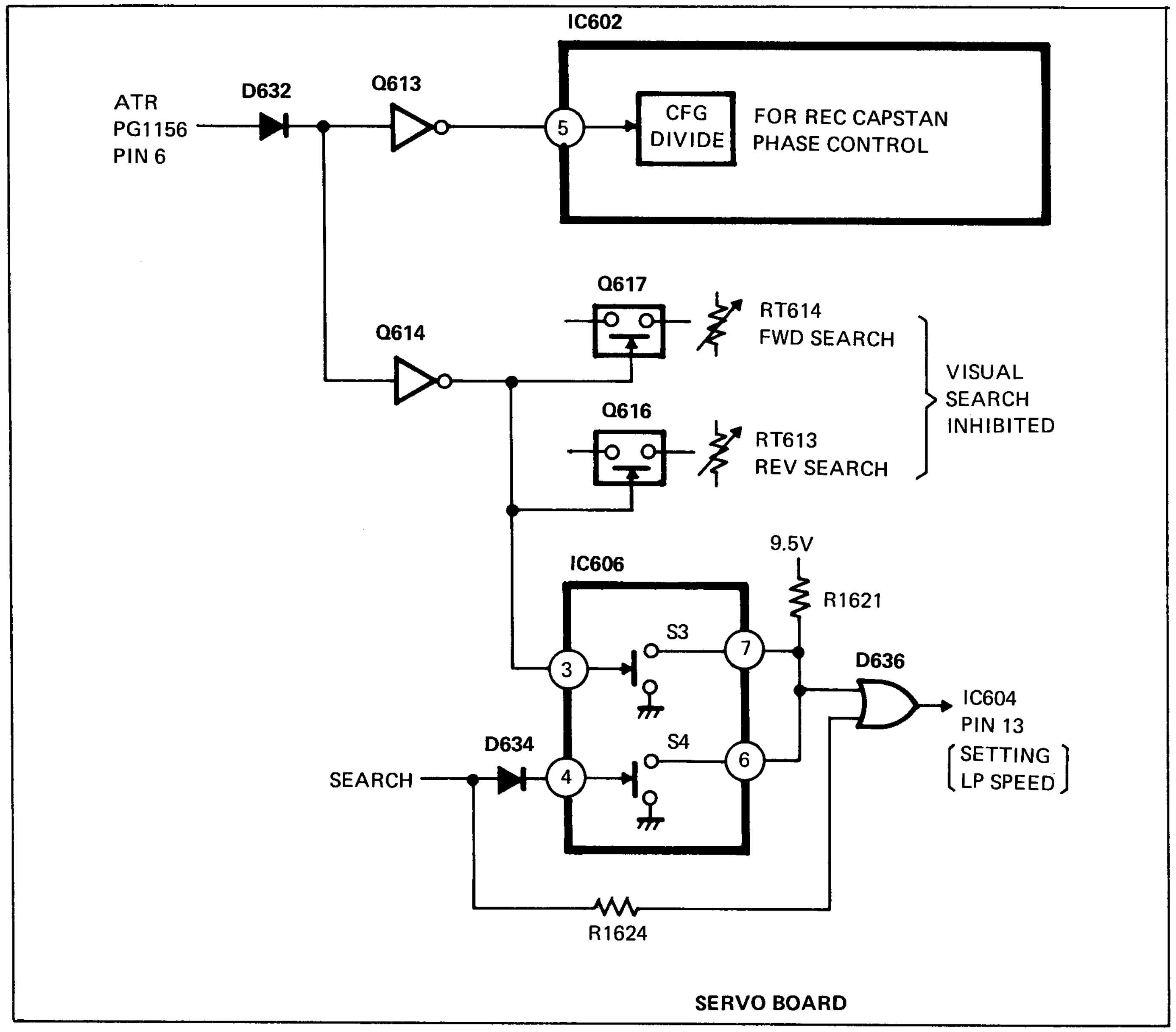

PB 9V
D4701
Q4716
Q4701
ATR
REC
VIDEO
PROCESS
ATR
REC
VIDEO
C4769
R4763
PG714
3
Q703
IC702
3
DECO
DE
1/2
50Hz
1/625
1/525
60Hz
Hi
Lo
9.5V
8
1/114
6
3.579545MHz
X701
(3.58MHz)
1H 1H 1H 1H 1H
1H H/2 H/2 1H 1H H/2 H/2 1H
1H 1H
ODD FIELD
(20 msec)
EVEN FIELD
(20 msec)
JACK BOARD
V. S TUNING BOARD
ATR SIGNAL ROUTE
PG4705-4
To Y/C, SERVO
PG4709-3
To SYSTEM
CONTROL
To SYNC
ROUTE
PG921
8
OFF
9.5V
ON
ATR: Hi
S905
ATR/INDEX
SWITCH
JACK
SYSTEM CONTROL

Fig. 11 ATR Circuit


IC602
ATR
PG1156
PIN 6
D632
Q613
5
CFG
DIVIDE
FOR REC CAPSTAN
PHASE CONTROL
Q617
RT614
FWD SEARCH
Q614
VISUAL
SEARCH
INHIBITED
Q616
RT613
REV SEARCH
9.5V
IC606
R1621
S3
3
7
D636
IC604
PIN 13
SETTING
LP SPEED
D634
S4
SEARCH
4
6
R1624
SERVO BOARD

The artificial composite sync generator circuit is IC702 installed on the VS tuning board.

IC702 is composed of the dividers and the decoder. It generates the composite sync signal at pin 3 from crystal X701 (3.579545 MHz) connected to pin 6. The signal differs in the composition of even and odd fields with the timing shown in the figure to differentiate between the fields.

This signal is inverted by Q703 to match the level with the positive sync signal and is supplied to the video system.

The buffer switch composed of Q4716 and Q4701 is provided at the video system input, and the artificial sync signal from Q703 is supplied to the video system in the ATR mode, and the record video signal is supplied to the video system in the ATR OFF mode.

Receiving this artificial V sync signal, the video system generates the sync signal and color subcarrier and supplies them to the servo system so that the servo operation during recording is possible in the ATR mode.

HITACHI
SERVICE MANUAL

TK **No. 2235E**

VT-88E(CT)

Technical Data

ADDITIONAL CIRCUIT	· CATV TUNER · PERI O.P AMP CIRCUIT BOARD			
REFERED MANUAL	· VT-88E, E(BS) : TECHNICAL DATA No. 2128E · VT-88E : EINSTELLUNG No.2130E · VT-88E, E(BS) SUPPLEMENT No. 2231E			
DIFFERENT PARTS	SEMI-CONDUCTORS			
	IC4851	5350605	IC	NJM4558SD
	FOR FINAL ASSEMBLY			
	164	5586119	VTR FRONT END	

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RF BOOSTER
- Schematic diagram 2
- Circuit board diagram 2

TUNER/IF
- Schematic diagram 3
- Circuit board diagram 5

IF PACK
- Circuit board diagram 6

JACK
- Schematic diagram 7
- Circuit board diagram 9

PERI JACK
- Schematic diagram 11
- Circuit diagram 11

PERI O·P AMP
- Schematic diagram 12
- Circuit diagram 12

VHS

THIS VIDEO DECK IS A VHS TYPE VIDEO RECORDER.
FOR PROPER OPERATION, ONLY THE VHS TYPE CASSETTE MUST BE USED.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

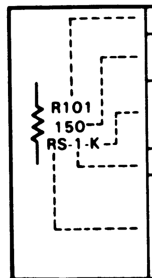
VIDEO CASSETTE RECORDER

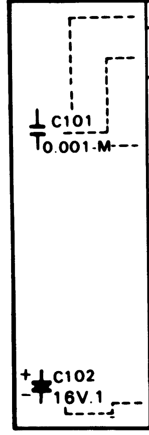
January 1985 **TOKAI WORKS**

SCHEMATIC/CIRCUIT BOARD DIAGRAMS

Note

1. Voltage measured at base of chassis with minimum volume control and no signal.
   (   ) are shown in recording condition.
2. Nomenclature of Resistors and Capacitors.

	Circuit No.	
 R101 150 RS-1-K	Value	No indicated Ω (Ohm) M : 1000kΩ
	Tolerance	No indicated ±5% K: ±10% M: ±20%
	Wattage	No indicated ¼ W
	Sort	No indicated Carbon film RC : Composition RW : Wire wound RS : Oxide metal film RN : Fixed metal film

	Circuit No.		
 C101 0.001-M C102 16V.1	Value	No indicated μF P : PF	
	Tolerance	No indicated ±10% J : ± 5% M : ±20% Z : +80%, −20% D : ±0.5pF C : ±0.25pF	
	Sort	⊥	Ceramic
		+ −	Electrolitic
		M	Mylar
		P	Polyester
		S	Styrol
	Voltage	No indicated 50WV	

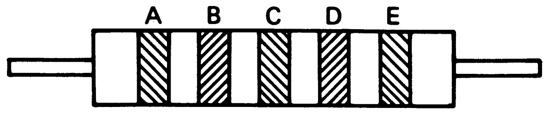
3. Be sure to make your orders of resistors and capacitors with value, voltage, tolerance and sort.
4. When replacing capacitors marked With * use specified ones stated on parts list since required temperature characteristics.

Cautions on use of MOS IC

1. The MOS IC is inserted in black foam for shipment. This foam is a conductor which short-circuits between the leads to prevent damage. Do not remove ICs from this foam during their storage. Avoid removing ICs from this foam, placing them on plastic which is likely to be charged with static electricity or inserting them into styrol foam.
2. High voltages may be applied during doldering caused by leakages from the soldering iron, so be sure to ground the tip of the soldering iron or use a low voltage soldering iron.
3. The human body, clothes made of synthetic fibres or nylon gloves may be charged with several thousands volts of static electricity because of friction, so a workers should be grounded.
4. Be sure to ground measuring instruments such as oscilloscopes, VTVMs, etc. used for repairs.

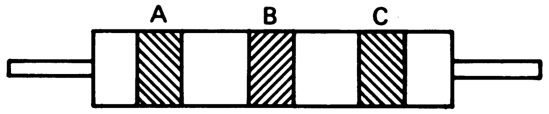
HOW TO READ CAPACITY AND INDUCTANCE OF RESISTOR SHAPE CAPACITORS AND COILS

CAPACITOR



CAPACITY: (10A+B)xC [PF]
TOLERANCE: D
RATED VOLTAGE: BODY COLOR
Pink: 25V
Green: 50V
CHARACTERISTICS: E

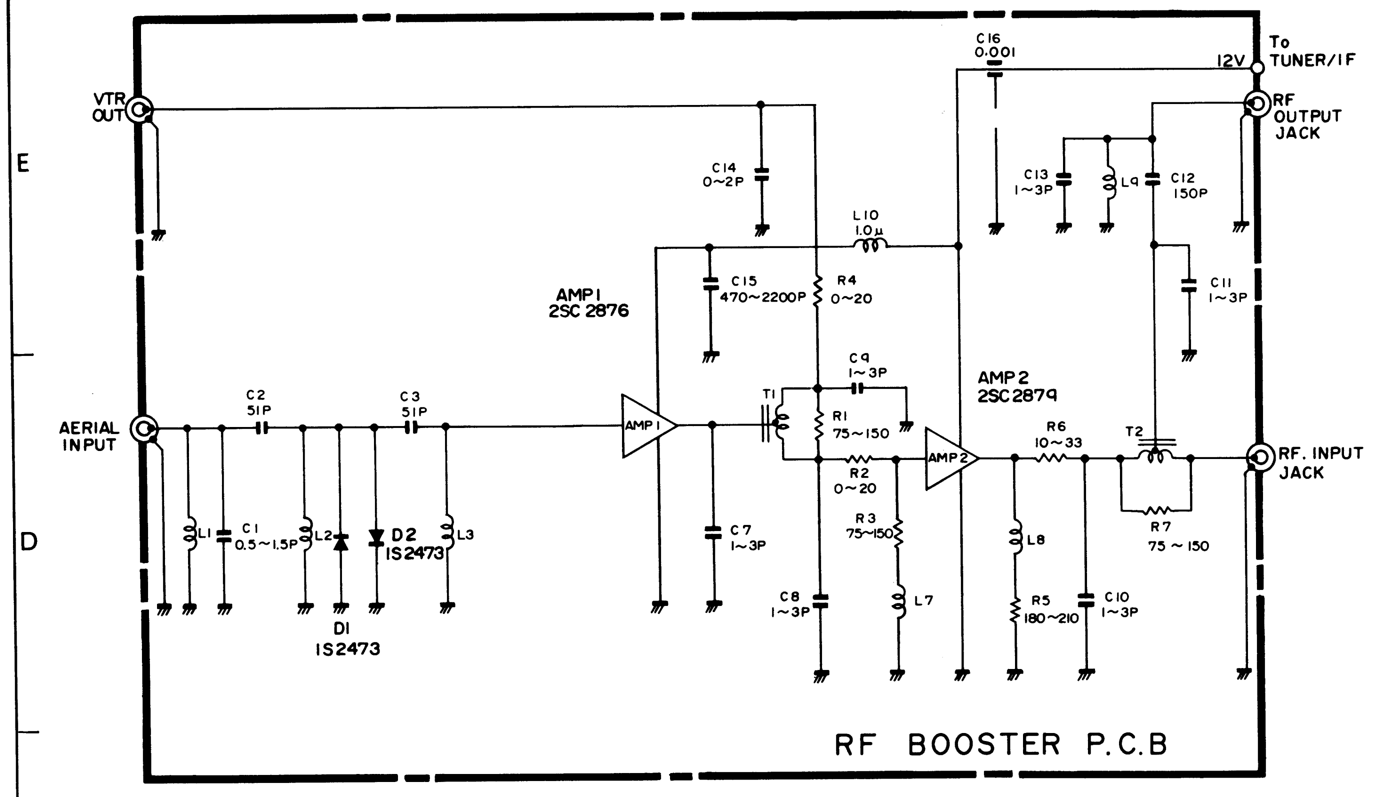
COIL



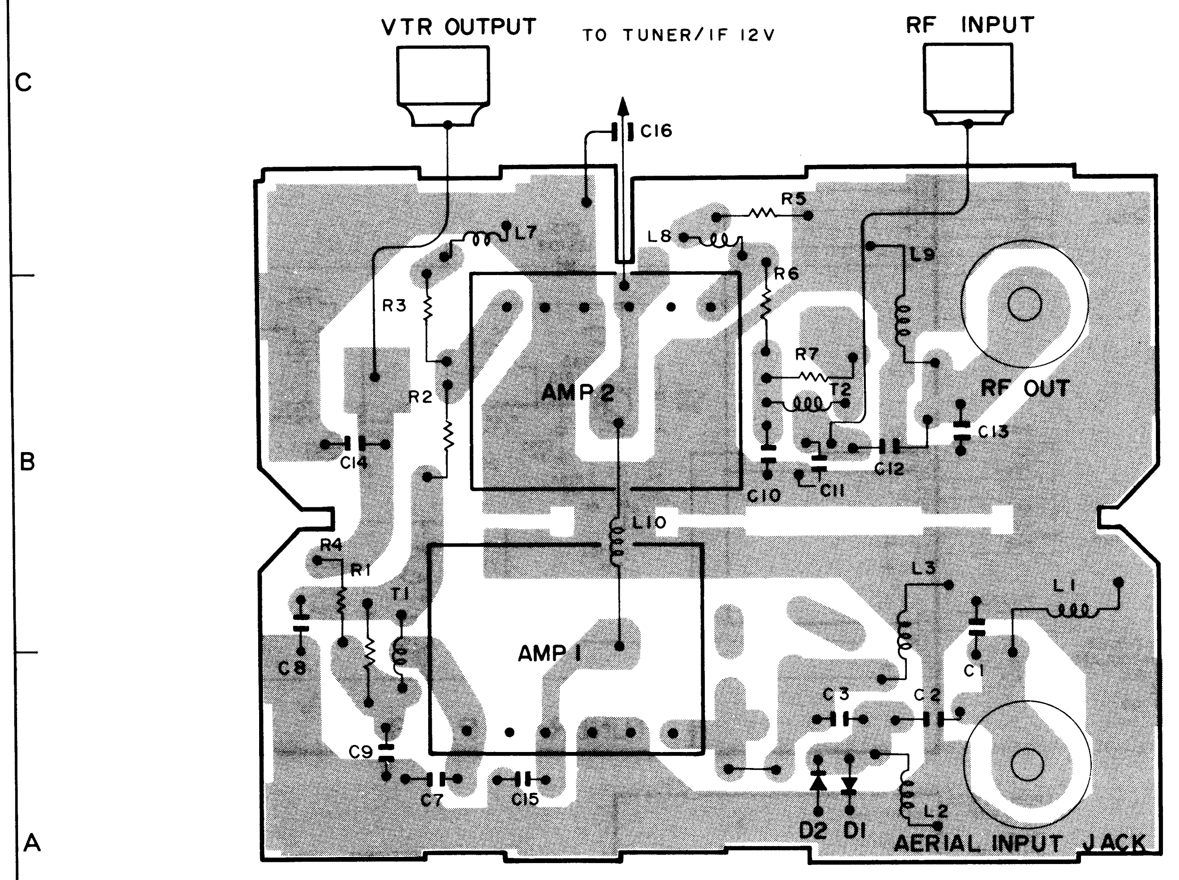
INDUCTANCE: (10A+B)xC [μH]

COLOR	A, B	C	D	E
Black	0	10^0	±20%	For temperature compensation
Brown	1	10^1		
Red	2	10^2		
Orange	3	10^3		
Yellow	4	10^4		
Green	5	10^5		
Blue	6			
Violet	7			
Grey	8		±30%	High dielectric constant type
White	9			For temperature compensation
Gold		10^{-1}	± 5%	
Silver		10^{-2}	±10%	High dielectric constant type

RF BOOSTER

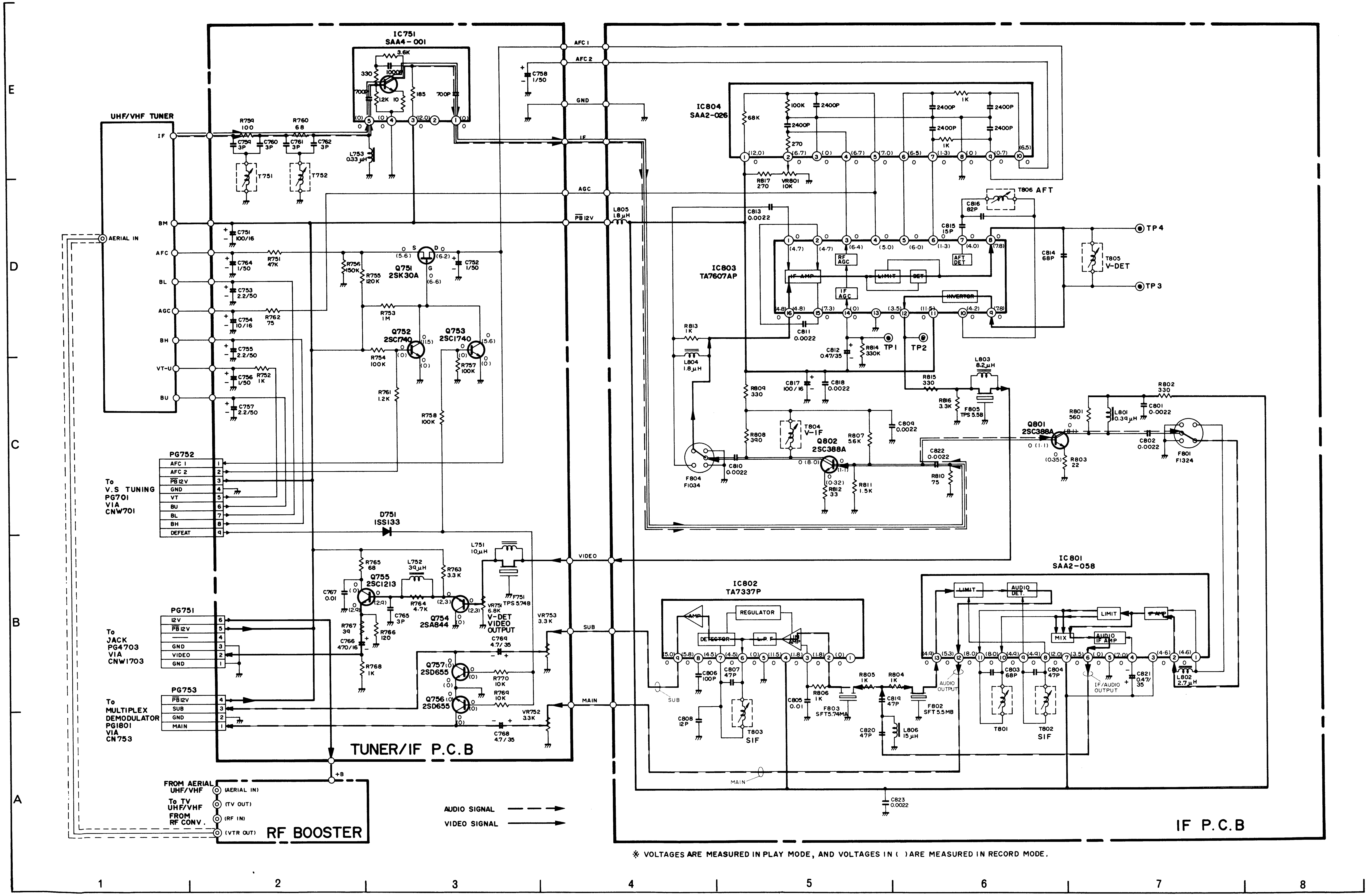

E
D
VTR OUT
AERIAL INPUT
C2
51P
C3
51P
L1
C1
0.5~1.5P
L2
D2
1S2473
L3
D1
1S2473
AMP1
2SC 2876
AMP1
C14
0~2P
C15
470~2200P
R4
0~20
L10
1.0μ
C7
1~3P
T1
C9
1~3P
R1
75~150
R2
0~20
R3
75~150
C8
1~3P
L7
AMP2
2SC2879
AMP2
R6
10~33
L8
R5
180~210
C10
1~3P
T2
R7
75 ~ 150
C16
0.001
12V
To TUNER/IF
RF OUTPUT JACK
C13
1~3P
L9
C12
150P
C11
1~3P
RF. INPUT JACK

RF BOOSTER P.C.B


C
B
A
VTR OUTPUT
TO TUNER/IF 12V
RF INPUT
C16
L7
L8
R5
R6
L9
R3
R7
T2
R2
AMP 2
RF OUT
C13
C14
C10
C11
C12
L10
R4
R1
T1
L3
L1
C8
AMP 1
C1
C3
C2
C9
C7
C15
D2
D1
L2
AERIAL INPUT JACK
1
2
3
4

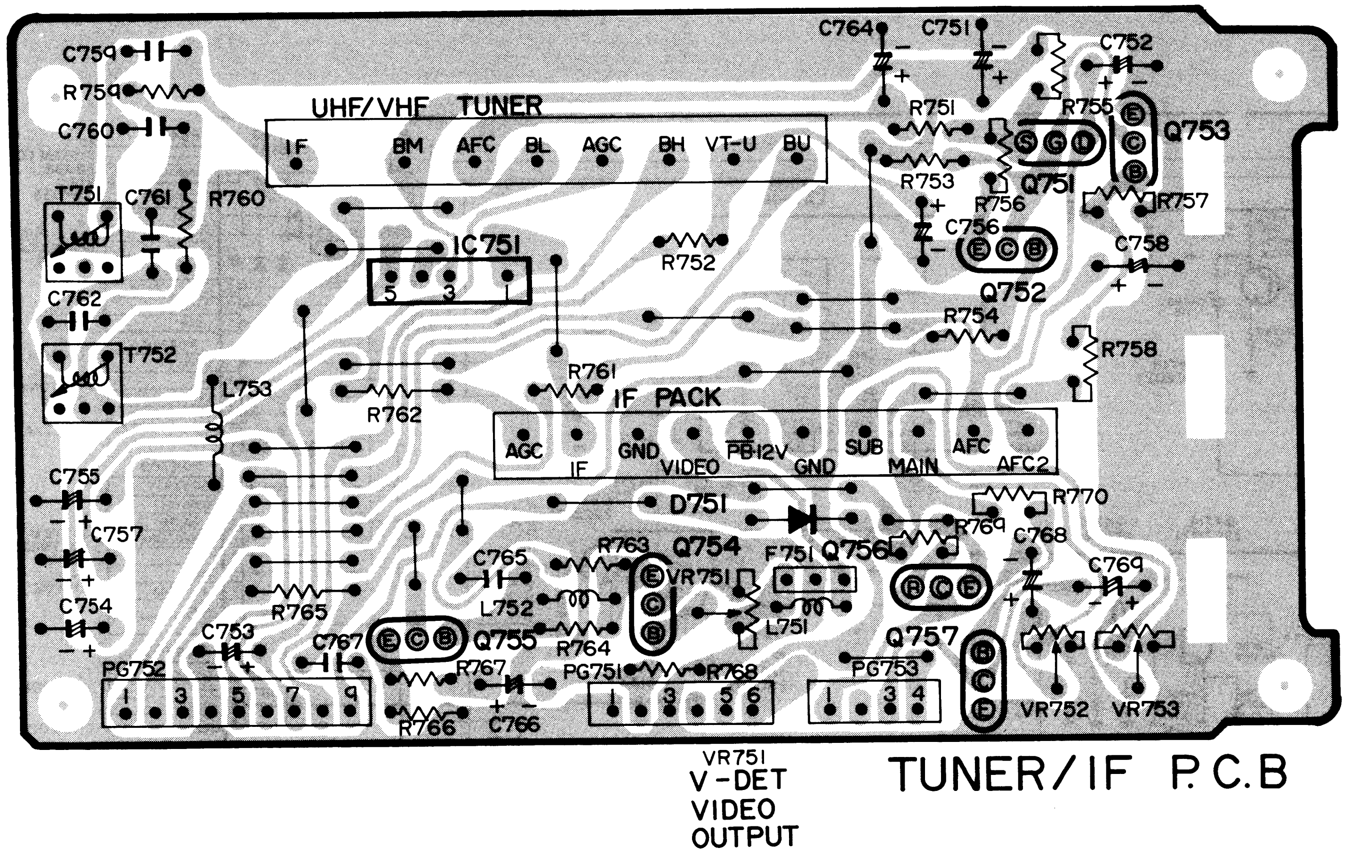
RF BOOSTER P.C.B

TUNER/IF


IC751
SAA4-001
UHF/VHF TUNER
IF
BM
AERIAL IN
AFC
BL
AGC
BH
VT-U
BU
R759 100
R760 68
C759 3P
C760 3P
C761 3P
C762 3P
T751
T752
L753 0.33μH
C751 100/16
C764 1/50
R751 47K
C753 2.2/50
C754 10/16
R762 75
C755 2.2/50
C756 1/50
R752 1K
C757 2.2/50
R756 150K
R755 120K
Q751 2SK30A
C752 1/50
R753 1M
Q752 2SC1740
Q753 2SC1740
R754 100K
R757 100K
R761 1.2K
R758 100K
PG752
AFC 1
AFC 2
PB 12V
GND
VT
BU
BL
BH
DEFEAT
To V.S TUNING PG701 VIA CNW701
D751 1SS133
L751 10μH
R765 68
L752 39μH
R763 3.3K
Q755 2SC1213
C767 0.01
R764 4.7K
C765 3P
Q754 2SA844
VR751 6.8K V-DET VIDEO OUTPUT
F751 TPS 5.74B
R767 39
R766 120
C766 470/16
R768 1K
C769 4.7/35
VR753 3.3K
Q757 2SD655
Q756 2SD655
R770 10K
R769 10K
VR752 3.3K
C768 4.7/35
PG751
12V
PB 12V
GND
VIDEO
To JACK PG4703 VIA CNW1703
PG753
SUB
MAIN
To MULTIPLEX DEMODULATOR PG1801 VIA CN753
TUNER/IF P.C.B
+B
FROM AERIAL UHF/VHF
To TV UHF/VHF
FROM RF CONV.
(AERIAL IN)
(TV OUT)
(RF IN)
(VTR OUT)
RF BOOSTER
AUDIO SIGNAL
VIDEO SIGNAL
C758 1/50
AFC 1
AFC 2
GND
AGC
PB 12V
L805 1.8μH
VIDEO
SUB
MAIN
IC804 SAA2-026
68K
100K
2400P
270
R817 270
VR801 10K
1K
T806 AFT
C816 82P
C815 15P
C813 0.0022
IC803 TA7607AP
IF AMP
RF AGC
IF AGC
LIMIT
DET
AFT DET
INVERTER
C814 68P
T805 V-DET
TP4
TP3
R813 1K
L804 1.8μH
C811 0.0022
C812 0.47/35
R814 330K
TP1
TP2
L803 8.2μH
R815 330
R816 3.3K
F805 TPS 5.5B
C817 100/16
C818 0.0022
R809 330
R808 390
T804 V-IF
Q802 2SC388A
R807 5.6K
C809 0.0022
C822 0.0022
F804 F1034
C810 0.0022
R810 75
R812 33
R811 1.5K
R801 560
L801 0.39μH
C801 0.0022
R802 330
Q801 2SC388A
C802 0.0022
R803 22
F801 F1324
IC801 SAA2-058
IC802 TA7337P
REGULATOR
AMP
DETECTOR
L.P.F
LIM AMP
LIMIT
AUDIO DET.
MIX
AUDIO IF AMP
IF AMP
C806 100P
C807 47P
C808 12P
T803 SIF
C805 0.01
R806 1K
R805 1K
R804 1K
F803 SFT5.74MA
C819 47P
C820 47P
L806 15μH
F802 SFT5.5MB
AUDIO OUTPUT
C803 68P
C804 47P
T801
T802 SIF
IF/AUDIO OUTPUT
C821 0.47/35
L802 2.7μH
C823 0.0022
IF P.C.B
A
B
C
D
E
1
2
3
4
5
6
7
8

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

TUNER/IF


UHF/VHF TUNER
IF
BM
AFC
BL
AGC
BH
VT-U
BU
C759
R759
C760
T751
C761
R760
C762
T752
L753
C755
C757
C754
C753
PG752
IC751
R752
R762
R761
IF PACK
AGC
IF
GND
VIDEO
PB12V
GND
SUB
MAIN
AFC
AFC2
D751
C765
R763
Q754
VR751
F751
Q756
L752
R764
L751
R765
C767
Q755
R767
R766
C766
PG751
R768
PG753
Q757
VR752
VR753
C764
C751
R751
R753
R756
R755
C752
Q753
Q751
R757
C756
Q752
C758
R754
R758
R770
R769
C768
C769
VR751
V-DET
VIDEO
OUTPUT
TUNER/IF P.C.B

Q751	
D	0 (6.2)
G	0 (6.6)
S	0 (5.6)

Q752	
B	0 (0)
C	0 (11.5)
E	0 (0)

Q753	
B	0 (0)
C	0 (5.6)
E	0 (0)

Q754	
B	0 (2.3)
C	0 (0)
E	0 (2.3)

Q755	
B	0 (2.9)
C	0 (0)
E	0 (2.9)

Q756	
B	0 (0)
C	0 (0)
E	0 (0)

Q757	
B	0 (0)
C	0 (0)
E	0 (0)

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

IC751

5	4	3	2	1
0 (0)	0 (0)	0 (12.0)	———	0 (0)

PG751

1	GND
2	VIDEO
3	GND
4	———
5	$\overline{PB}$12V
6	12V

To
JACK
PG4703
VIA
CNW1703

PG752

9	DEFEAT
8	BH
7	BL
6	BU
5	VT
4	GND
3	$\overline{PB}$12V
2	AFS2
1	AFS1

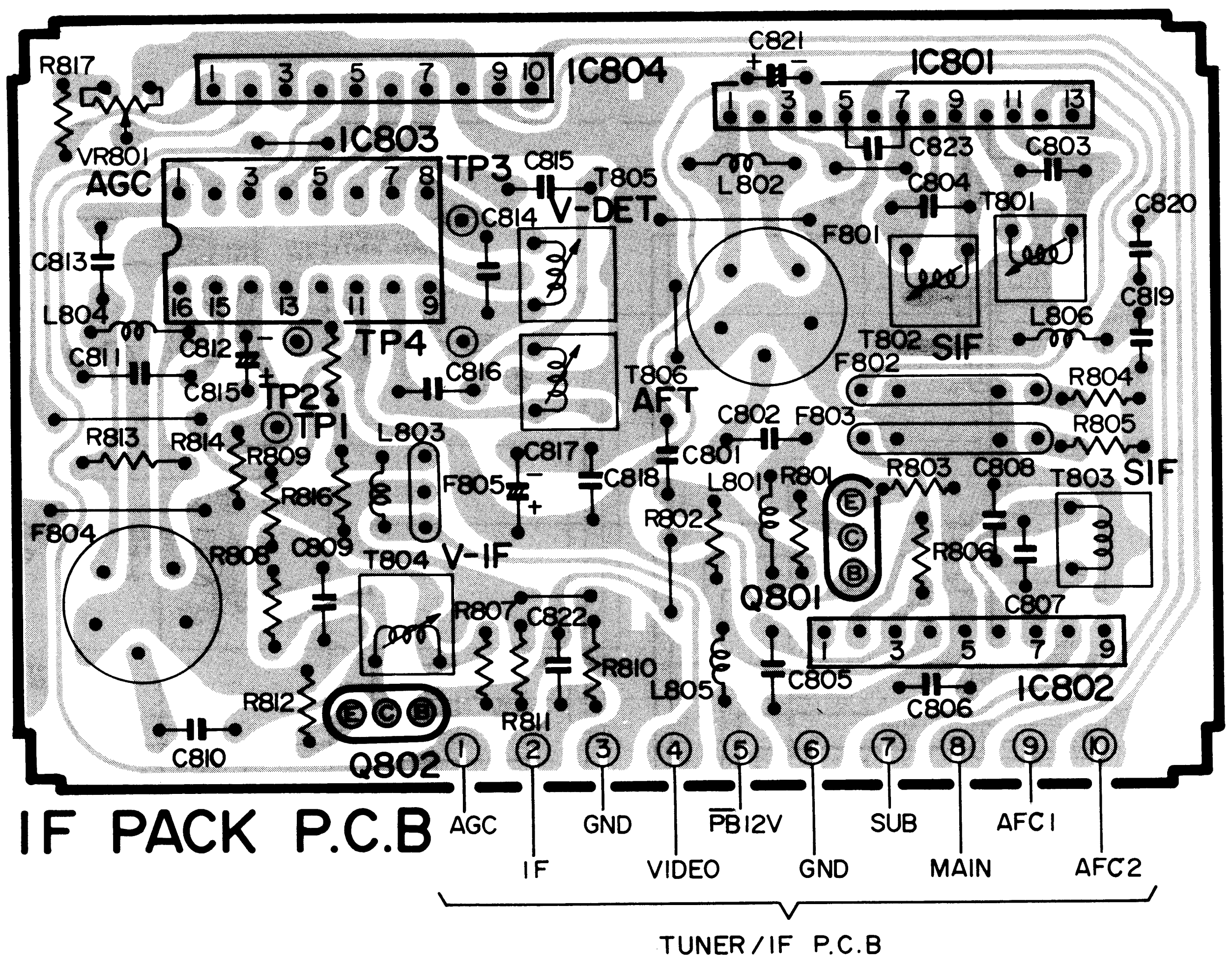
To
V·S TUNING
PG701
VIA
CNW701

PG753

1	MAIN
2	GND
3	SUB
4	$\overline{PB}$12V

To
MULTIPLEX
DEMODULATOR
PG1801
VIA
CNW753

IF PACK


R817
VR801
AGC
IC803
IC804
C821
IC801
C823
C803
TP3
C815
T805
V-DET
C814
L802
C804
T801
C820
C813
F801
C819
L804
C811
C812
C815
TP4
TP2
TP1
C816
T806
AFT
T802
SIF
L806
F802
R804
F803
R805
R813
R814
R809
L803
C817
C818
C802
C801
R803
C808
T803
SIF
F805
R816
L801
R801
R802
F804
R808
C809
T804
V-IF
R806
Q801
C807
R807
C822
R810
IC802
R812
R811
L805
C805
C806
C810
Q802
IF PACK P.C.B
① AGC
② IF
③ GND
④ VIDEO
⑤ PB12V
⑥ GND
⑦ SUB
⑧ MAIN
⑨ AFC1
⑩ AFC2
TUNER/IF P.C.B

IC801

1	2	3	4	5	6	7	8	9	10	11	12	13
0 (4.6)	0 (4.6)		0 (7.0)	0 (0)	0 (3.5)	0 (12.0)	0 (4.9)	0 (4.9)	0 (8.0)	0 (8.0)	0 (5.3)	0 (4.9)

IC802

1	2	3	4	5	6	7	8	9
0 (0)	0 (1.8)	0 (1.8)	0 (11.5)	0 (0)	0 (4.5)	0 (4.5)	0 (5.8)	0 (5.0)

IC804

1	2	3	4	5	6	7	8	9	10
0 (12.0)	0 (6.7)	0 (0)	0 (6.7)	0 (7.0)	0 (6.5)	0 (1.3)	0 (0)	0 (0.7)	0 (6.5)

IC803

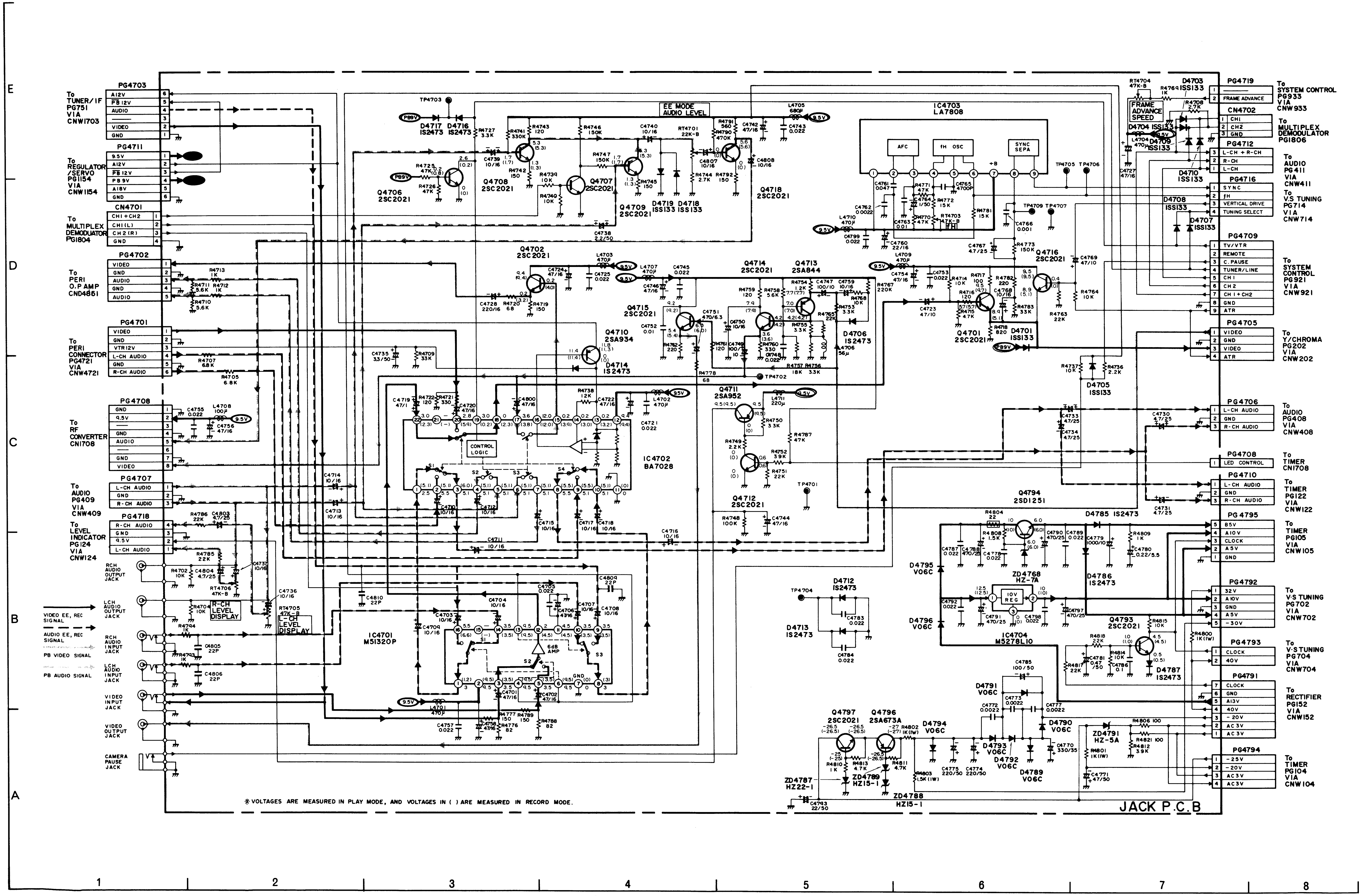
1	2	3	4	5	6	7	8
0 (4.7)	0 (4.7)	0 (6.4)	0 (5.0)	0 (6.0)	0 (1.3)	0 (4.0)	0 (7.8)
16	15	14	13	12	11	10	9
0 (4.8)	0 (4.8)	0 (7.3)	0 (0)	0 (3.5)	0 (11.5)	0 (4.2)	0 (7.8)

Q801	
B	0 (1.1)
C	0 (8.1)
E	0 (0.35)

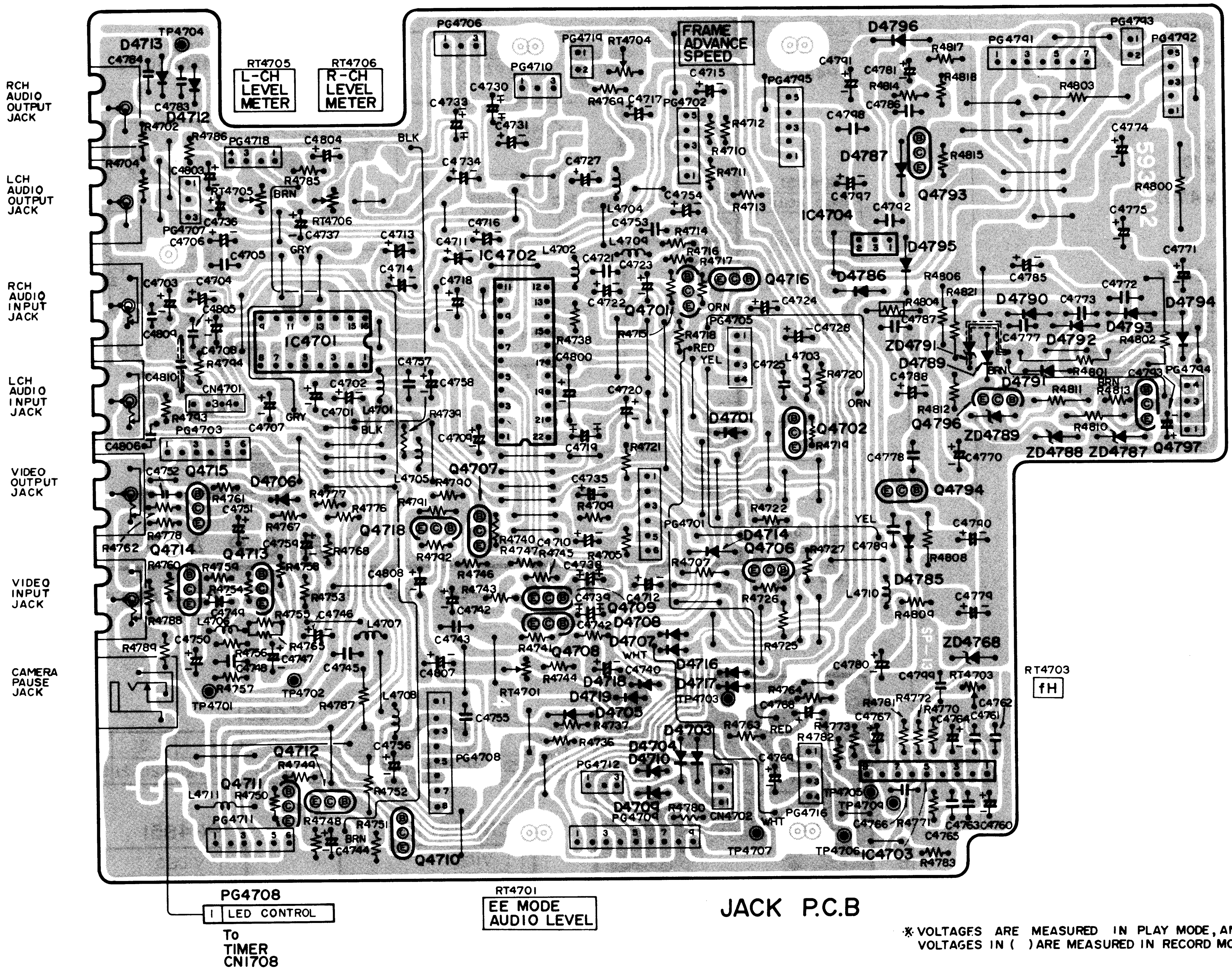
Q802	
B	0 (1.1)
C	0 (8.0)
E	0 (0.32)

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

JACK


PG4703
To TUNER/IF PG751 VIA CNW1703
A12V
PB 12V
AUDIO
VIDEO
GND
PG4711
To REGULATOR /SERVO PG1154 VIA CNW1154
9.5V
A12V
PB 12V
PB 9V
A18V
GND
CN4701
To MULTIPLEX DEMODULATOR PG1804
CH1+CH2
CH1(L)
CH2(R)
GND
PG4702
To PERI O.P AMP CND4861
VIDEO
GND
AUDIO
PG4701
To PERI CONNECTOR PG4721 VIA CNW4721
VTR12V
L-CH AUDIO
R-CH AUDIO
PG4708
To RF CONVERTER CN1708
PG4707
To AUDIO PG409 VIA CNW409
PG4718
To LEVEL INDICATOR PG124 VIA CNW124
RCH AUDIO OUTPUT JACK
LCH AUDIO OUTPUT JACK
RCH AUDIO INPUT JACK
LCH AUDIO INPUT JACK
VIDEO INPUT JACK
VIDEO OUTPUT JACK
CAMERA PAUSE JACK
VIDEO EE, REC SIGNAL
AUDIO EE, REC SIGNAL
PB VIDEO SIGNAL
PB AUDIO SIGNAL
R-CH LEVEL DISPLAY
L-CH LEVEL DISPLAY
EE MODE AUDIO LEVEL
Q4706 2SC2021
Q4708 2SC2021
Q4707 2SC2021
Q4709 2SC2021
Q4718 2SC2021
Q4702 2SC2021
Q4714 2SC2021
Q4713 2SA844
Q4715 2SC2021
Q4710 2SA934
Q4711 2SA952
Q4712 2SC2021
Q4716 2SC2021
Q4701 2SC2021
Q4794 2SD1251
Q4793 2SC2021
Q4797 2SC2021
Q4796 2SA673A
IC4703 LA7808
AFC
fH OSC
SYNC SEPA
IC4702 BA7028
CONTROL LOGIC
IC4701 M51320P
64B AMP
IC4704 M5278L10
10V REG
ZD4768 HZ-7A
ZD4791 HZ-5A
ZD4787 HZ22-1
ZD4789 HZ15-1
ZD4788 HZ15-1
D4717 IS2473
D4716 IS2473
D4719 ISS133
D4718 ISS133
D4706 IS2473
D4714 IS2473
D4701 ISS133
D4705 ISS133
D4703 ISS133
D4704 ISS133
D4709 ISS133
D4710 ISS133
D4708 ISS133
D4707 ISS133
D4712 IS2473
D4713 IS2473
D4785 IS2473
D4786 IS2473
D4787 IS2473
D4795 V06C
D4796 V06C
D4791 V06C
D4794 V06C
D4790 V06C
D4793 V06C
D4792 V06C
D4789 V06C
FRAME ADVANCE SPEED
TP4703
TP4705
TP4706
TP4709
TP4707
TP4702
TP4701
TP4704
PB9V
9.5V
PG4719
To SYSTEM CONTROL PG933 VIA CNW933
FRAME ADVANCE
CN4702
To MULTIPLEX DEMODULATOR PG1806
CH1
CH2
GND
PG4712
To AUDIO PG411 VIA CNW411
L-CH + R-CH
R-CH
L-CH
PG4716
To V.S TUNING PG714 VIA CNW714
SYNC
fH
VERTICAL DRIVE
TUNING SELECT
PG4709
To SYSTEM CONTROL PG921 VIA CNW921
TV/VTR
REMOTE
C. PAUSE
TUNER/LINE
CH1
CH2
CH1+CH2
GND
ATR
PG4705
To Y/CHROMA PG202 VIA CNW202
VIDEO
GND
ATR
PG4706
To AUDIO PG408 VIA CNW408
L-CH AUDIO
R-CH AUDIO
PG4708
To TIMER CN1708
LED CONTROL
PG4710
To TIMER PG122 VIA CNW122
PG4795
To TIMER PG105 VIA CNW105
B5V
A10V
CLOCK
A5V
PG4792
To V·S TUNING PG702 VIA CNW702
32V
-30V
PG4793
To V·S TUNING PG704 VIA CNW704
40V
PG4791
To RECTIFIER PG152 VIA CNW152
A13V
-20V
AC3V
PG4794
To TIMER PG104 VIA CNW104
-25V
JACK P.C.B
E
D
C
B
A
1
2
3
4
5
6
7
8

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.


RCH AUDIO OUTPUT JACK
LCH AUDIO OUTPUT JACK
RCH AUDIO INPUT JACK
LCH AUDIO INPUT JACK
VIDEO OUTPUT JACK
VIDEO INPUT JACK
CAMERA PAUSE JACK
RT4705 L-CH LEVEL METER
RT4706 R-CH LEVEL METER
FRAME ADVANCE SPEED
IC4701
IC4702
IC4703
IC4704
RT4703 fH
PG4708
1 LED CONTROL
To TIMER CN1708
RT4701
EE MODE AUDIO LEVEL

JACK P.C.B

※ VOLTAGES ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) ARE MEASURED IN RECORD MODE.

IC4701

9	10	11	12	13	14	15	16
3.5 (3.5)	3.5(3.5)	4.5 (4.5)	2 (4.5)	9.5 (9.5)	3.5 (3.5)	— (—)	5.5 (6.6)
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
3.0 (3.0)	0 (0)	9.5 (9.5)	3.5 (3.5)	9.5 (9.5)	3.5 (3.5)	9.5 (9.5)	3.0 (1.2)

IC4702

11	0 (0)	12	9.4 (9.4)
10	5.1 (5.1)	13	0.2 (3.2)
9	5.1 (5.5)	14	0.2 (3.0)
8	5.5 (5.5)	15	0.2 (3.9)
7	5.1 (5.1)	16	12.0 (12.0)
6	5.1 (5.1)	17	3.6 (3.8)
5	5.1 (5.1)	18	0 (2.3)
4	5.1 (5.1)	19	3.0 (0.2)
3	5.1 (6.0)	20	2.8 (5.9)
2	5.5 (5.1)	21	— (—)
1	2.5 (5.1)	22	3.0 (2.3)

IC4704

2	3	1
10.0 (10.0)	0 (0)	12.5 (12.5)

PG4701

1	VIDEO
2	GND
3	VTR 12V
4	LCH AUDIO
5	GND
6	RCH AUDIO

To PERI CONNECTOR PG4721 VIA CNW4701

PG4702

5	AUDIO
4	GND
3	AUDIO
2	GND
1	VIDEO

To PERI O.P AMP CND4851

PG4703

6	A12V
5	$\overline{PB}$12V
4	AUDIO
3	GND
2	VIDEO
1	GND

To TUNER/IF PG751 VIA CNW1703

PG4705

1	VIDEO
2	GND
3	VIDEO
4	ATR

To Y/CHROMA PG202 VIA CNW202

PG4706

1	LCH AUDIO
2	GND
3	RCH AUDIO

To AUDIO PG408 VIA CNW408

PG4707

1	LCH AUDIO
2	GND
3	RCH AUDIO

To AUDIO PG409 VIA CNW409

PG4708

1	GND
2	9.5V
3	——
4	GND
5	AUDIO
6	——
7	GND
8	VIDEO

To RF CONVERTER CN1708

PG4709

1	TV/VTR
2	REMOTE
3	C PAUSE
4	TUNER/LINE
5	CH1
6	CH2
7	CH-1+CH-2
8	GND
9	ATR

To SYSTEM CONTROL PG921 VIA CNW921

PG4710

1	L-CH AUDIO
2	GND
3	R-CH AUDIO

To TIMER PG122 VIA CNW122

PG4711

1	9.5V
2	A12V
3	$\overline{PB}$12V
4	PB9V
5	A18V
6	GND

To REGULATOR/SERVO PG1154 VIA CNW1154

PG4712

3	L-CH+R-CH
2	R-CH
1	L-CH

To AUDIO PG411 VIA CNW411

PG4716

1	SYNC
2	fH
3	VERTICAL DRIVE
4	TUNING SELECT

To V.S TUNING PG714 VIA CNW714

PG4718

4	LCH AUDIO
3	GND
2	9.5V
1	RCH AUDIO

To LEVEL INDICATOR PG124 VIA CNW124

PG4719

1	——
2	FRAME ADVANCE

To SYSTEM CONTROL PG933 VIA CNW933

PG4791

7	CLOCK
6	GND
5	A13V
4	40V
3	-20V
2	AC3V
1	AC3V

To RECTIFIER PG152 VIA CNW152

PG4792

5	-30V
4	A5V
3	GND
2	A10V
1	32V

To V.S TUNING PG702 VIA CNW702

PG4793

1	CLOCK
2	40V

To V.S TUNING PG704 VIA CNW704

PG4794

4	AC3V
3	AC3V
2	-20V
1	-25V

To TIMER PG104 VIA CNW104

PG4795

5	B5V
4	A10V
3	CLOCK
2	A5V
1	GND

To TIMER PG105 VIA CNW105

CN4701

1	CH1+CH2
2	CH1 (L)
3	CH2 (R)
4	GND

To MULTIPLEX DEMODULATOR PG1804

CN4702

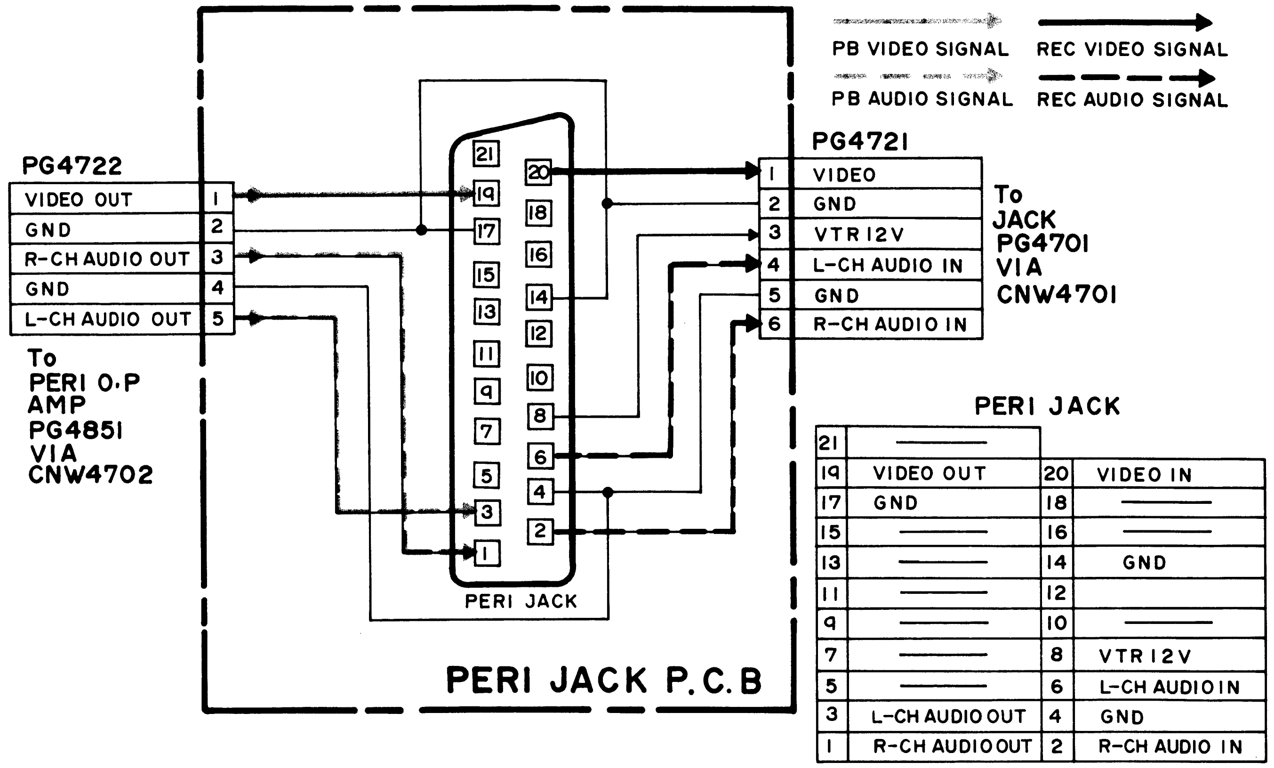
1	CH1
2	CH2
3	GND

To MULTIPLEX DEMODULATOR PG1806

	Q4701	Q4702	Q4706	Q4708	Q4709	Q4710	Q4711
B	5.7(5.7)	0.2(4.0)	0.2(0.8)	1.7(1.7)	1.7(1.7)	11.4(11.4)	0 (0)
C	9.5(9.7)	9.4(9.4)	2.6(0.2)	5.3(5.3)	5.3(5.3)	0 (0)	9.5(9.5)
E	8.9(5.1)	0.2(3.2)	0 (0)	1.3(1.3)	1.3(1.3)	11.8(11.3)	9.5(9.5)

	Q4712	Q4713	Q4714	Q4715	Q4716	Q4718	Q4793	Q4794	Q4796	Q4797
B	0.6(0.6)	7.0(7.0)	4.2(4.2)	6.0(6.0)	0.4(0)	0 (0)	1.0 1.0	6.0(6.0)	-26.5(-26.5)	-25(-25)
C	0 (0)	4.2(4.2)	7.9(7.9)	9.2(9.2)	9.5(9.5)	5.6(5.6)	4.5(4.5)	10.0(10.0)	-27(-27)	-26.5(-26.5)
E	0 (0)	7.7(7.7)	3.6(3.6)	5.4(5.4)	8.9(5.1)	0 (0)	0.5(0.5)	6.0(6.0)	-26(-26)	-26.5(-26.5)

PERI JACK


PB VIDEO SIGNAL
REC VIDEO SIGNAL
PB AUDIO SIGNAL
REC AUDIO SIGNAL
PG4722
1 VIDEO OUT
2 GND
3 R-CH AUDIO OUT
4 GND
5 L-CH AUDIO OUT
To PERI O.P AMP PG4851 VIA CNW4702
21 19 17 15 13 11 9 7 5 3 1
20 18 16 14 12 10 8 6 4 2
PERI JACK
PG4721
1 VIDEO
2 GND
3 VTR 12V
4 L-CH AUDIO IN
5 GND
6 R-CH AUDIO IN
To JACK PG4701 VIA CNW4701
PERI JACK P.C.B

PERI JACK

21	———		
19	VIDEO OUT	20	VIDEO IN
17	GND	18	———
15	———	16	———
13	———	14	GND
11	———	12	
9	———	10	———
7	———	8	VTR 12V
5	———	6	L-CH AUDIO IN
3	L-CH AUDIO OUT	4	GND
1	R-CH AUDIO OUT	2	R-CH AUDIO IN

To PERI O.P AMP PG4851 VIA CNW4702

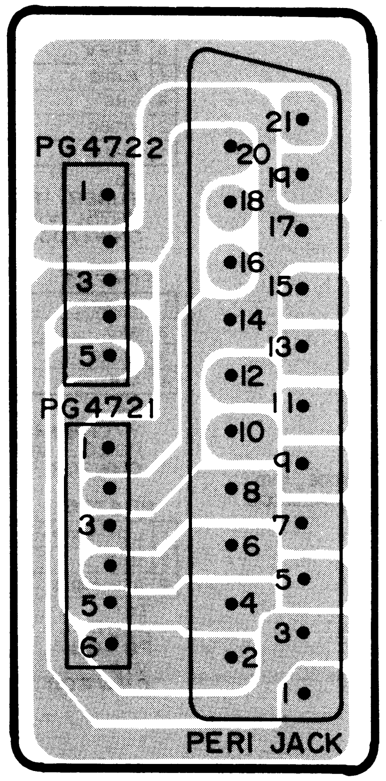
PG4722

1	VIDEO OUT
2	GND
3	R-CH AUDIO OUT
4	GND
5	L-CH AUDIO OUT

To JACK PG4701 VIA CNW4701

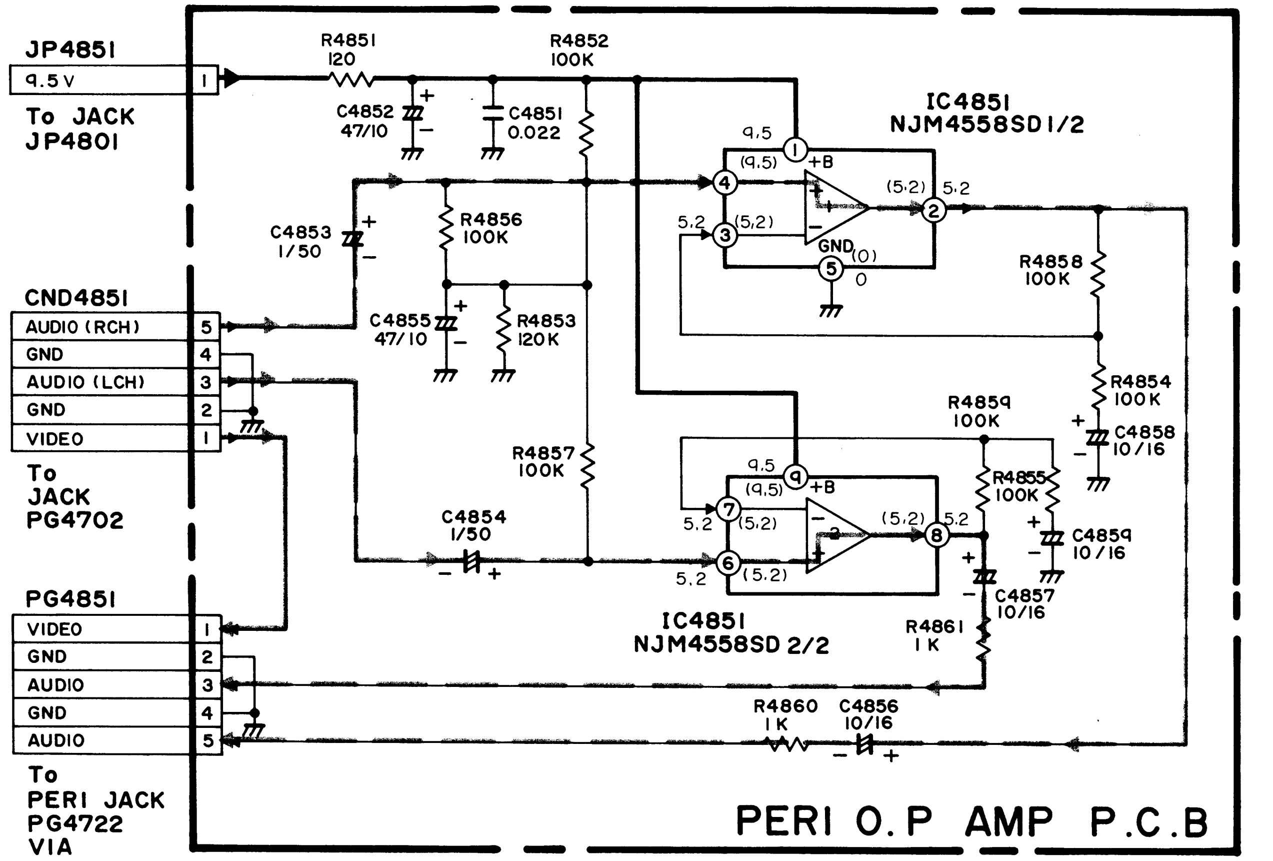
PG4721

1	VIDEO
2	GND
3	VTR 12V
4	L-CH AUDIO IN
5	GND
6	R-CH AUDIO IN

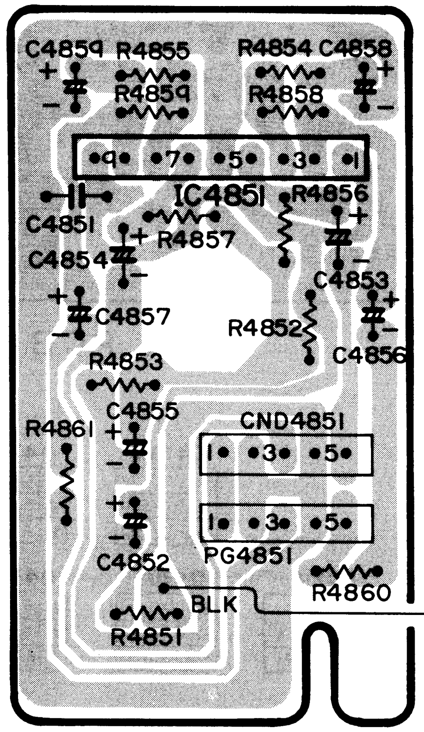

PG4722
1
3
5
PG4721
1
3
5
6
21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
PERI JACK

PERI JACK P.C.B

PERI O·P AMP


JP4851
1 9.5V
To JACK JP4801
R4851 120
R4852 100K
C4852 47/10
C4851 0.022
IC4851 NJM4558SD 1/2
C4853 1/50
R4856 100K
C4855 47/10
R4853 120K
CND4851
5 AUDIO (RCH)
4 GND
3 AUDIO (LCH)
2 GND
1 VIDEO
To JACK PG4702
PG4851
1 VIDEO
2 GND
3 AUDIO
4 GND
5 AUDIO
To PERI JACK PG4722 VIA CNW4702
9.5
(9.5)
+B
(5.2) 5.2
5.2 (5.2)
GND (0)
0
R4858 100K
R4854 100K
C4858 10/16
R4859 100K
R4855 100K
C4859 10/16
R4857 100K
C4854 1/50
IC4851 NJM4558SD 2/2
C4857 10/16
R4861 1K
R4860 1K
C4856 10/16
PERI O.P AMP P.C.B

※VOLTAGE ARE MEASURED IN PLAY MODE, AND VOLTAGES IN ( ) MEASURED IN RECORD MODE.


C4859 R4855
R4854 C4858
R4859
R4858
9 7 5 3 1
IC4851
R4856
C4851
R4857
C4854
C4853
C4857
R4852
C4856
R4853
C4855
R4861
CND4851
1 3 5
1 3 5
PG4851
C4852
R4860
BLK
R4851

PERI O.P AMP P.C.B

IC4851

9	8	7	6	5	4	3	2	1
9.5(9.5)	5.2(5.2)	5.2(5.2)	5.2(5.2)	0 (0)	5.2(5.2)	5.2(5.2)	5.2(5.2)	9.5(9.5)

CND4851

1	VIDEO
2	GND
3	AUDIO (LCH)
4	GND
5	AUDIO (RCH)

To JACK PG4702

PG4851

1	VIDEO
2	GND
3	AUDIO
4	GND
5	AUDIO

To PERI JACK PG4722 VIA CNW4702

JP4851

1	9.5V

To JACK JP4801